DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: **Kimberly-Clark PA, LLC**
Facility Address: **Front Street & Avenue of the States, Chester, PA 19013**
Facility EPA ID #: **PAD002274991**

1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units [SWMU], Regulated Units [RU], and Areas of Concern [AOC])

   [X] If yes – check here and continue with #2 below.

   [ ] If no – re-evaluate existing data, or

   [ ] If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

____ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

X If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The Kimberly-Clark PA, LLC facility (Kimberly-Clark or facility) is situated between State Route 291 and the Delaware River at the intersection of Front Street and Avenue of the States in Chester, Pennsylvania. The facility's operating area consists of 74 acres that has a variety of buildings including process areas, plant offices, and final product storage and distribution warehouses, as well as a raw water filter plant, a cogeneration plant (power plant), and outdoor coal pile storage and handling areas. The majority of the operating area is covered with impermeable surfaces (i.e., buildings and asphalt-paved or concrete roads/parking lots); however, there are relatively small localized gravel areas throughout the property. These areas are located directly north of the mill building (Mill Area Underground Storage Tank [UST] Removal Area), in the vicinity of the raw water filter plant (No. 2 Fuel Oil Area), and along the banks of the Delaware River. In the coal handling and storage area (Penn Steel Area), the western half of the surface consists of asphalt paving. The eastern half of the property is compacted gravel and coal, and the coal storage and handling structures. Topography at the site slopes gently toward the Delaware River with approximately six to 10 feet of relief from Front Street to the Delaware River. Access to the property is limited. A chain link fence surrounds the entire property. The facility is secured by a 24-hour guard service.

The area is an "enterprise zone" designated by the City of Chester planning commission. Other industrial/commercial areas are located adjacent to the facility along the Delaware River. Physician offices are located to the north, Harrah's Casino and Race Track are located directly east, and a highway maintenance department is located to the west of the facility. The Delaware River and the New Jersey/Pennsylvania border form the south/southeast boundary of the facility. Chester Creek flows through the property and separates the coal pile storage and handling area from the facility's operational areas and the cogeneration plant. Kimberly-Clark owns the majority of the surrounding adjacent properties which are used primarily for parking.

Records indicate that the Chester Shipping Company, a ship building facility, operated some areas of the facility from the early 1900s until the 1940s (Atlantic Environmental Consulting Services, LLC [Atlantic], 2000). Scott Paper Company (Scott) took ownership of the property and began operating in 1910. Chester Shipping Company continued to operate in several of the easternmost buildings until the 1940s. Scott then merged with Kimberly-Clark Corporation in December 1995 and the name changed to Kimberly-Clark Tissue Company effective 1996. On December 15, 2000, the facility notified Pennsylvania Department of Environmental Protection (PADEP) that Kimberly-Clark Tissue Company was to be liquidated and the assets were to be distributed to the parent company, Kimberly-Clark Corporation. The ownership and name changed to Kimberly-Clark Pennsylvania, LLC effective January 1, 2003. Collectively, these three entities will be referred to as Kimberly-Clark hereafter. Kimberly-Clark Pennsylvania, LLC continues to maintain operations to date.

Kimberly-Clark currently operates as a small quantity generator (SQG) facility under United States Environmental Protection Agency (USEPA) ID No. PAD002274991. The facility also operates under a Title V Operating Permit (TVOP-23-0014) for air emissions, a National Pollutant Discharge Elimination System (NPDES) permit (PA0013081) for

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

effluent outfall discharges, and a Delaware County Regional Water Quality Control Authority (DELCORA) Industrial Discharge Permit (1DE 01-04) for discharges of treated wastewater from the manufacture of sanitary paper products, river water clarification, and associated utilities.

The facility obtains its process water directly from the Delaware River via its raw water intake. The raw water is piped from the intake, through the wet well and into the raw water filter plant, where it is treated in three of four clarifiers. The raw river water is mixed with a polymer. The mixture is then gravity settled in sand filters. Clean water is then held in the mill water silo prior to use.

The facility operates a permit-by-rule (PBR) wastewater elementary neutralization system that treats spent sulfuric acid and sodium hydroxide from the demineralizer bed regeneration process in the raw water filter plant. The demineralizer system treats mill supply water (raw water drawn from the Delaware River and/or city water) prior to use as boiler feed water. Treated wastewater (including water removed from the clarifiers during cleaning) generated at the facility is discharged into the DELCORA system under permit.

The facility also operates and maintains its own cogeneration power plant. The cogeneration power plant (Boiler No. 10) provides steam to the mill using anthracite culm mixed with bituminous coal that is obtained from the Poconos area of Pennsylvania. The culm is stored outdoors or in sheds directly on the ground surface in the Penn Steel Area, a 14-acre parcel located directly southwest of, and across Chester Creek from the mill area of the facility.

The Penn Steel Area was formerly utilized as a saw mill and coal yard until the late 1880s and as a steel casting facility by the Penn Steel Casting and Machine Company (Penn Steel), from the early 1890s into the 1960s (Atlantic, 2001). The western portion of the parcel was acquired by Scott in 1971 to undertake a Brownfield's initiative and return the abandoned industrial property into a functional entity of the facility. During the 1970s, Scott paved the Penn Steel Area and utilized it as a parking area for tractor trailers that stored finished goods prior to off-site shipment. In the 1980s, Scott developed the eastern half of the property as coal pile storage and handling areas that support the cogeneration plant. Kimberly-Clark entered into a 100-year lease agreement with the City of Chester in 1985 for the eastern portion of the Penn Steel Area (Atlantic, 2001). The majority of the flat-lying surface of the Penn Steel Area is capped with asphalt and the remaining areas are covered with coal piles, buildings, and coal handling/sorting structures. A buffer zone of small trees and overgrowth lies between the fenced portion of the Penn Steel Area, and Chester Creek and the Delaware River.

There have been major investigations and remedial activities completed at three areas of concern (AOCs): (1) the No. 2 Fuel Oil Area located within the mill area, (2) the Mill Area UST Removal Area, and (3) the Penn Steel Area. Contaminated soil and groundwater were identified in each of the three areas. The facility has requested no further action determinations from PADEP for the No. 2 Fuel Oil Area and the Penn Steel Area; however, available records indicate that formal determinations have not been issued. (Note: These two areas of investigation were not formally entered into the PADEP Land Recycling Program [Act 2].) In addition, while a remediation system was proposed to treat contaminated soil and groundwater at the Mill Area UST Removal Area, facility representatives indicate that no response to the proposal was received from PADEP and the remediation system was never installed.

Waste Types and Quantities

On August 13, 1980, Scott submitted a Notification of Hazardous Waste Activity to USEPA for generation and treatment/storage/disposal (TSD) of hazardous wastes. With its submittal, the facility indicated it was filing as a TSD facility as a precautionary measure in the event wastes would accumulate beyond 90 days due to circumstances beyond its control. The facility was assigned USEPA ID No. PAD002274991 on October 9, 1980.

According to the facility's historical waste permitting documents, hazardous wastes generated at the facility have included:

- D-listed wastes D001 (characteristically ignitable); D002 (characteristically corrosive); D003 (characteristically reactive); D007 (chromium); D008 (lead); D009 (mercury); and D039 (tetrachloroethene [PCE])
- F-listed wastes F001 and F002 (spent halogenated solvents) and F003, F004, and F005 (spent non-halogenated solvents)
- P-listed wastes P030 (cyanide) and P105 (sodium azide)

- U-listed wastes U002 (acetone); U044 (chloroform); U122 (formaldehyde); U144 (acetic acid/lead acetate); U154 (methanol/methyl alcohol); U159 (methyl ethyl ketone [MEK]); U226 (1,1,1-trichloroethane [TCA]); and U239 (xylene)

The facility currently operates as a SQG, generating minor quantities of solvents and paint related wastes (brushes, rollers, empty paint cans, etc.). The facility also generates nonhazardous wastes including oil from machine maintenance, waste water-based polymers (glue), fluorescent/sodium vapor light bulbs and ballasts, baghouse wastes, wood wastes, refractory brick, and ash. The facility routinely submits biennial residual waste reports identifying these nonhazardous waste streams.

The paint-related wastes, waste oils, and glue are stored in 55-gallon drums or totes in Building 81 located on the east end of property. The hazardous wastes are stored in a caged area that consists of four bermed sections that are locked at all times. This area also stores empty 55-gallon drums. The light bulbs and ballasts are stored in a universal waste storage area located inside of the mill.

Groundwater: There have been no known releases to groundwater from the facility's regulated hazardous waste accumulation area (Building 81); however, releases to groundwater have been documented for the three AOCs.

Extensive groundwater investigation and remediation work was completed at the No. 2 Fuel Oil Area. Available groundwater data suggests that the removal of separate-phase liquid (SPL) occurred to the extent possible and the operation of the groundwater remediation system was successful at remediating groundwater at and southeast of the source area (Monitoring Well [MW]-1) below appropriate regulatory levels. According to the Final Report (Atlantic, 2000) submitted to PADEP in April 2000, an isolated area of SPL (less than 0.1 inches thick) remains near MW-1. This area is covered with ballast and asphalt surfaces. The most recent groundwater sample, which consisted of groundwater in direct contact with the SPL, was collected from the source area monitoring well (MW-1) in July 1999. The sample was analyzed for the PADEP Short List of Petroleum Products for Fuel Oil Nos. 2, 4, 5, and 6. Low concentrations of benzene (0.3 [J] ug/L), cumene (1.5 ug/L), fluorene (2 [J] ug/L), and phenanthrene (3 [J] ug/L) were detected in the sample. The 1999 concentrations are below the current PADEP used aquifer total dissolved solids (TDS) less than 2,500 milligrams per liter (mg/L) non-residential medium specific concentration (MSCs) of 5 micrograms per liter (ug/L) for benzene; 3,500 ug/L for cumene; 1,900 ug/L for fluorene; and 1,100 ug/L for phenanthrene. Downgradient wells MW-11, SUMP-1, SUMP-2, and GW-1 were last sampled January 1998. These samples were analyzed only for benzene, toluene, ethylbenzene and xylenes (BTEX) and naphthalene, none of which were detected above laboratory detection limits; therefore, it is unknown whether polynuclear aromatic hydrocarbons (PAHs) are present in groundwater southeast of the source area. Soil samples collected directly downgradient of MW-11 and GW-1 in 1998 suggest that these constituents may have been present in groundwater at the time of the sampling although likely at low concentrations. The chemical quality of the groundwater southwest (vicinity of the No. 6 fuel oil aboveground storage tank [AST]) of the source area is unknown. Relatively high total petroleum hydrocarbons (TPH) concentrations were detected in soil samples in the vicinity of the No. 6 fuel oil AST and petroleum odors and sheens were observed on groundwater that infiltrated trenches dug around the bulkhead. No monitoring wells were installed; therefore, no groundwater data is available for this area.

In 1990, concentrations of benzene and ethylbenzene were detected above appropriate regulatory levels in two of the monitoring wells (MW-4 and MW-8) installed directly north of Buildings 20 and 21 in the Mill Area UST Removal Area. The 1990 concentrations of benzene detected in monitoring wells MW-4 (6.4 ug/L) and MW-8 (43 ug/L) are above the current PADEP non-residential MSC of 5 ug/L. The 1990 concentration of ethylbenzene detected in monitoring well MW-8 (1,500 ug/L) is above the current MSC of 700 ug/L. Elevated concentrations of xylenes were also present ranging from 40 ug/L in monitoring well MW-9 to 8,800 ug/L in monitoring well MW-5. These concentrations are below the MSC of 10,000 ug/L for total xylenes. Although a dual-phase vacuum extraction system was proposed to remediate groundwater, it was reportedly never implemented. Therefore, the chemical quality of the groundwater in this area is not known. The UST removal area, particularly directly north of Buildings 20 and 21, is gravel covered.

Groundwater analytical data for the Penn Steel Area suggests that while residual SPL remains, it is no longer degrading groundwater above appropriate regulatory levels. Groundwater samples collected from the groundwater/SPL interface at monitoring wells MW-8 and MW-10 during five sampling events conducted from March 2000 through May 2001 showed that none of the analytes analyzed for were detected above the PADEP non-residential MSCs, except for benzene that was

detected at monitoring well MW-8 (6.2 ug/L) above the MSC of 5 ug/L during one sampling event (May 2001). Benzene was not detected in either MW-8 or MW-10 above laboratory detection limits during any of the other sampling events. Removal of the SPL was deemed infeasible because it is present in isolated pockets or discontinuous sheens. According to the Final Report (Atlantic, 2001), the facility maintains the asphalt parking lot that was placed over the former Penn Steel operations, and the areas where SPL was identified.

Groundwater at or in the vicinity of the facility is not used for municipal, domestic, or agricultural use. In addition, the majority of the property is asphalt or concrete covered, and it is not expected that contaminated groundwater or residual SPL would be easily accessible during daily operations. In addition, the facility is entirely fenced and continuously monitored by security, which further limits accessibility to potentially contaminated areas to authorized personnel. Therefore, it is not expected that additional controls are needed for daily operations. However, because groundwater is shallow (three to five feet below the ground surface [bgs]), additional controls may be required for subsurface work (i.e., utility work) that may encounter contaminated groundwater.

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

_____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

____ YE Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Kimberly-Clark PA, LLC** facility, EPA ID # **PAD002274991** located at **Front Street & Avenue of the States, Chester, PA 19013**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater". This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

__X__ IN - More information is needed to make a determination.

Completed by (signature) _____ Date _____

(print) _____

(title) _____

Supervisor (signature) _____ Date _____

(print) _____

(title) _____

(EPA Region or State) _____

Locations where References may be found:

USEPA Region III
Waste and Chemical Mgmt. Division
1650 Arch Street
Philadelphia, PA 19103

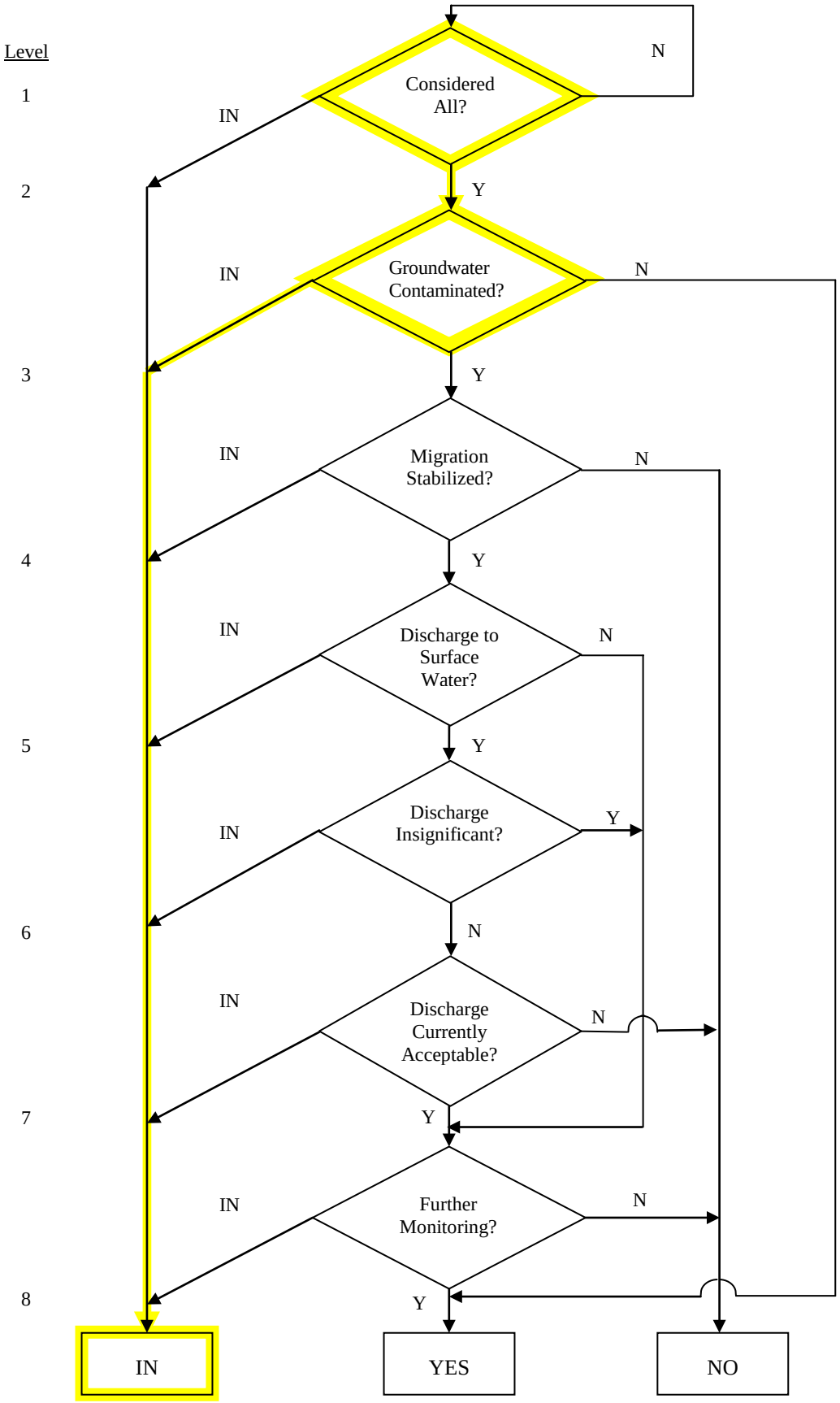
PADEP
South East Regional Office
2 E. Main Street
Norristown, PA 19401

Contact telephone and e-mail numbers

(name) _____
(phone#) _____
(e-mail) _____

Facility Name:	Kimberly-Clark PA, LLC
EPA ID#	PAD002274991
City/State	Chester, PA 19013

MIGRATION OF CONTAMINATED GROUNDWATER UNDER CONTROL (CA 750)



DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: **Kimberly-Clark PA, LLC**
Facility Address: **Front Street & Avenue of the States, Chester, PA 19013**
Facility EPA ID #: **PAD002274991**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   [X] If yes – check here and continue with #2 below.

   [ ] If no – re-evaluate existing data, or

   [ ] If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			Releases to groundwater have been documented for the three AOCs. VOCs, SVOCs and SPL present.
Air (indoors) [2]			X	Contaminated soil was left in place due to the presence of subsurface building structures and underground utility lines, and SPL remains in the subsurface in the No. 2 Fuel Oil Area and the Penn Steel Area. Vapor intrusion pathway into onsite buildings that are used on a daily basis is a potential exposure pathway from soil and/or groundwater and warrants further evaluation.
Surface Soil (e.g., <2 ft)		X		Contamination detected in soil is below 2 feet in depth.
Surface Water			X	Groundwater quality southwest of the No. 2 Fuel Oil Area source area (No. 6 fuel oil UST and bulkhead area) located approximately 150 feet of the Delaware River, and in the Mill Area UST Removal Area located approximately 500 feet upgradient of the Delaware River is currently unknown.
Sediment			X	Same rationale as groundwater.
Subsurf. Soil (e.g., >2 ft)	X			Releases to soils from the facility's leaking AST and UST systems and former historic operations unrelated to the facility. VOCs, SVOCs and PAHs present.
Air (outdoors)		X		The facility currently operates under a TVOP for various emission units associated with paper manufacturing.

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

____ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

X If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):
The Kimberly-Clark PA, LLC facility (Kimberly-Clark or facility) is situated between State Route 291 and the Delaware River at the intersection of Front Street and Avenue of the States in Chester, Pennsylvania. The facility's operating area consists of 74 acres that has a variety of buildings including process areas, plant offices, and final product storage and distribution warehouses, as well as a raw water filter plant, a cogeneration plant (power plant), and outdoor coal pile storage and handling areas. The majority of the operating area is covered with impermeable surfaces (i.e., buildings and asphalt-paved or concrete roads/parking lots); however, there are relatively small localized gravel areas throughout the property. These areas are located directly north of the mill building (Mill Area Underground Storage Tank [UST] Removal Area), in the vicinity of the raw water filter plant (No. 2 Fuel Oil Area), and along the banks of the Delaware River. In the coal handling and storage area (Penn Steel Area), the western half of the surface consists of asphalt paving. The eastern half of the property is compacted gravel and coal, and the coal storage and handling structures. Topography at the site slopes gently toward the Delaware River with approximately six to 10 feet of relief from Front Street to the Delaware River. Access to the property is limited. A chain link fence surrounds the entire property. The facility is secured by a 24-hour guard service.

The area is an "enterprise zone" designated by the City of Chester planning commission. Other industrial/commercial areas are located adjacent to the facility along the Delaware River. Physician offices are located to the north, Harrah's Casino and Race Track are located directly east, and a highway maintenance department is located to the west of the facility. The Delaware River and the New Jersey/Pennsylvania border form the south/southeast boundary of the facility. Chester Creek flows through the property and separates the coal pile storage and handling area from the facility's operational areas and the cogeneration plant. Kimberly-Clark owns the majority of the surrounding adjacent properties which are used primarily for parking.

Records indicate that the Chester Shipping Company, a ship building facility, operated some areas of the facility from the early 1900s until the 1940s (Atlantic Environmental Consulting Services, LLC [Atlantic], 2000). Scott Paper Company (Scott) took ownership of the property and began operating in 1910. Chester Shipping Company continued to operate in several of the easternmost buildings until the 1940s. Scott then merged with Kimberly-Clark Corporation in December 1995 and the name changed to Kimberly-Clark Tissue Company effective 1996. On December 15, 2000, the facility notified Pennsylvania Department of Environmental Protection (PADEP) that Kimberly-Clark Tissue Company was to be liquidated and the assets were to be distributed to the parent company, Kimberly-Clark Corporation. The ownership and name changed to Kimberly-Clark Pennsylvania, LLC effective January 1, 2003. Collectively, these three entities will be referred to as Kimberly-Clark hereafter. Kimberly-Clark Pennsylvania, LLC continues to maintain operations to date.

Kimberly-Clark currently operates as a small quantity generator (SQG) facility under United States Environmental Protection Agency (USEPA) ID No. PAD002274991. The facility also operates under a Title V Operating Permit (TVOP-23-0014) for air emissions, a National Pollutant Discharge Elimination System (NPDES) permit (PA0013081) for effluent outfall discharges, and a Delaware County Regional Water Quality Control Authority (DELCORA) Industrial

Discharge Permit (1DE 01-04) for discharges of treated wastewater from the manufacture of sanitary paper products, river water clarification, and associated utilities.

The facility obtains its process water directly from the Delaware River via its raw water intake. The raw water is piped from the intake, through the wet well and into the raw water filter plant, where it is treated in three of four clarifiers. The raw river water is mixed with a polymer. The mixture is then gravity settled in sand filters. Clean water is then held in the mill water silo prior to use.

The facility operates a permit-by-rule (PBR) wastewater elementary neutralization system that treats spent sulfuric acid and sodium hydroxide from the demineralizer bed regeneration process in the raw water filter plant. The demineralizer system treats mill supply water (raw water drawn from the Delaware River and/or city water) prior to use as boiler feed water. Treated wastewater (including water removed from the clarifiers during cleaning) generated at the facility is discharged into the DELCORA system under permit.

The facility also operates and maintains its own cogeneration power plant. The cogeneration power plant (Boiler No. 10) provides steam to the mill using anthracite culm mixed with bituminous coal that is obtained from the Poconos area of Pennsylvania. The culm is stored outdoors or in sheds directly on the ground surface in the Penn Steel Area, a 14-acre parcel located directly southwest of, and across Chester Creek from the mill area of the facility.

The Penn Steel Area was formerly utilized as a saw mill and coal yard until the late 1880s and as a steel casting facility by the Penn Steel Casting and Machine Company (Penn Steel), from the early 1890s into the 1960s (Atlantic, 2001). The western portion of the parcel was acquired by Scott in 1971 to undertake a Brownfield's initiative and return the abandoned industrial property into a functional entity of the facility. During the 1970s, Scott paved the Penn Steel Area and utilized it as a parking area for tractor trailers that stored finished goods prior to off-site shipment. In the 1980s, Scott developed the eastern half of the property as coal pile storage and handling areas that support the cogeneration plant. Kimberly-Clark entered into a 100-year lease agreement with the City of Chester in 1985 for the eastern portion of the Penn Steel Area (Atlantic, 2001). The majority of the flat-lying surface of the Penn Steel Area is capped with asphalt and the remaining areas are covered with coal piles, buildings, and coal handling/sorting structures. A buffer zone of small trees and overgrowth lies between the fenced portion of the Penn Steel Area, and Chester Creek and the Delaware River.

There have been major investigations and remedial activities completed at three areas of concern (AOCs): (1) the No. 2 Fuel Oil Area located within the mill area, (2) the Mill Area UST Removal Area, and (3) the Penn Steel Area. Contaminated soil and groundwater were identified in each of the three areas. The facility has requested no further action determinations from PADEP for the No. 2 Fuel Oil Area and the Penn Steel Area; however, available records indicate that formal determinations have not been issued. (Note: These two areas of investigation were not formally entered into the PADEP Land Recycling Program [Act 2].) In addition, while a remediation system was proposed to treat contaminated soil and groundwater at the Mill Area UST Removal Area, facility representatives indicate that no response to the proposal was received from PADEP and the remediation system was never installed.

Waste Types and Quantities

On August 13, 1980, Scott submitted a Notification of Hazardous Waste Activity to USEPA for generation and treatment/storage/disposal (TSD) of hazardous wastes. With its submittal, the facility indicated it was filing as a TSD facility as a precautionary measure in the event wastes would accumulate beyond 90 days due to circumstances beyond its control. The facility was assigned USEPA ID No. PAD002274991 on October 9, 1980.

According to the facility's historical waste permitting documents, hazardous wastes generated at the facility have included:

- D-listed wastes D001 (characteristically ignitable); D002 (characteristically corrosive); D003 (characteristically reactive); D007 (chromium); D008 (lead); D009 (mercury); and D039 (tetrachloroethene [PCE])

- F-listed wastes F001 and F002 (spent halogenated solvents) and F003, F004, and F005 (spent non-halogenated solvents)
- P-listed wastes P030 (cyanide) and P105 (sodium azide)
- U-listed wastes U002 (acetone); U044 (chloroform); U122 (formaldehyde); U144 (acetic acid/lead acetate); U154 (methanol/methyl alcohol); U159 (methyl ethyl ketone [MEK]); U226 (1,1,1-trichloroethane [TCA]); and U239 (xylene)

The facility currently operates as a SQG, generating minor quantities of solvents and paint related wastes (brushes, rollers, empty paint cans, etc.). The facility also generates nonhazardous wastes including oil from machine maintenance, waste water-based polymers (glue), fluorescent/sodium vapor light bulbs and ballasts, baghouse wastes, wood wastes, refractory brick, and ash. The facility routinely submits biennial residual waste reports identifying these nonhazardous waste streams.

The paint-related wastes, waste oils, and glue are stored in 55-gallon drums or totes in Building 81 located on the east end of property. The hazardous wastes are stored in a caged area that consists of four bermed sections that are locked at all times. This area also stores empty 55-gallon drums. The light bulbs and ballasts are stored in a universal waste storage area located inside of the mill.

Groundwater: There have been no known releases to groundwater from the facility's regulated hazardous waste accumulation area (Building 81); however, releases to groundwater have been documented for the three AOCs.

Extensive groundwater investigation and remediation work was completed at the No. 2 Fuel Oil Area. Available groundwater data suggests that the removal of separate-phase liquid (SPL) occurred to the extent possible and the operation of the groundwater remediation system was successful at remediating groundwater at and southeast of the source area (Monitoring Well [MW]-1) below appropriate regulatory levels. According to the Final Report (Atlantic, 2000) submitted to PADEP in April 2000, an isolated area of SPL (less than 0.1 inches thick) remains near MW-1. This area is covered with ballast and asphalt surfaces. The most recent groundwater sample, which consisted of groundwater in direct contact with the SPL, was collected from the source area monitoring well (MW-1) in July 1999. The sample was analyzed for the PADEP Short List of Petroleum Products for Fuel Oil Nos. 2, 4, 5, and 6. Low concentrations of benzene (0.3 [J] ug/L), cumene (1.5 ug/L), fluorene (2 [J] ug/L), and phenanthrene (3 [J] ug/L) were detected in the sample. The 1999 concentrations are below the current PADEP used aquifer total dissolved solids (TDS) less than 2,500 milligrams per liter (mg/L) non-residential medium specific concentration (MSCs) of 5 micrograms per liter (ug/L) for benzene; 3,500 ug/L for cumene; 1,900 ug/L for fluorene; and 1,100 ug/L for phenanthrene. Downgradient wells MW-11, SUMP-1, SUMP-2, and GW-1 were last sampled January 1998. These samples were analyzed only for benzene, toluene, ethylbenzene and xylenes (BTEX) and naphthalene, none of which were detected above laboratory detection limits; therefore, it is unknown whether polynuclear aromatic hydrocarbons (PAHs) are present in groundwater southeast of the source area. Soil samples collected directly downgradient of MW-11 and GW-1 in 1998 suggest that these constituents may have been present in groundwater at the time of the sampling although likely at low concentrations. The chemical quality of the groundwater southwest (vicinity of the No. 6 fuel oil aboveground storage tank [AST]) of the source area is unknown. Relatively high total petroleum hydrocarbons (TPH) concentrations were detected in soil samples in the vicinity of the No. 6 fuel oil AST and petroleum odors and sheens were observed on groundwater that infiltrated trenches dug around the bulkhead. No monitoring wells were installed; therefore, no groundwater data is available for this area.

In 1990, concentrations of benzene and ethylbenzene were detected above appropriate regulatory levels in two of the monitoring wells (MW-4 and MW-8) installed directly north of Buildings 20 and 21 in the Mill Area UST Removal Area. The 1990 concentrations of benzene detected in monitoring wells MW-4 (6.4 ug/L) and MW-8 (43 ug/L) are above the current PADEP non-residential MSC of 5 ug/L. The 1990 concentration of ethylbenzene detected in monitoring well MW-8 (1,500 ug/L) is above the current MSC of 700 ug/L. Elevated concentrations of xylenes were also present ranging from 40 ug/L in monitoring well MW-9 to 8,800 ug/L in monitoring well MW-5. These concentrations are below the MSC of 10,000 ug/L for total xylenes. Although a dual-phase vacuum extraction system was proposed to remediate

groundwater, it was reportedly never implemented. Therefore, the chemical quality of the groundwater in this area is not known. The UST removal area, particularly directly north of Buildings 20 and 21, is gravel covered.

Groundwater analytical data for the Penn Steel Area suggests that while residual SPL remains, it is no longer degrading groundwater above appropriate regulatory levels. Groundwater samples collected from the groundwater/SPL interface at monitoring wells MW-8 and MW-10 during five sampling events conducted from March 2000 through May 2001 showed that none of the analytes analyzed for were detected above the PADEP non-residential MSCs, except for benzene that was detected at monitoring well MW-8 (6.2 ug/L) above the MSC of 5 ug/L during one sampling event (May 2001). Benzene was not detected in either MW-8 or MW-10 above laboratory detection limits during any of the other sampling events. Removal of the SPL was deemed infeasible because it is present in isolated pockets or discontinuous sheens. According to the Final Report (Atlantic, 2001), the facility maintains the asphalt parking lot that was placed over the former Penn Steel operations, and the areas where SPL was identified.

Groundwater at or in the vicinity of the facility is not used for municipal, domestic, or agricultural use. In addition, the majority of the property is asphalt or concrete covered, and it is not expected that contaminated groundwater or residual SPL would be easily accessible during daily operations. In addition, the facility is entirely fenced and continuously monitored by security, which further limits accessibility to potentially contaminated areas to authorized personnel. Therefore, it is not expected that additional controls are needed for daily operations. However, because groundwater is shallow (three to five feet below the ground surface [bgs]), additional controls may be required for subsurface work (i.e., utility work) that may encounter contaminated groundwater.

Air: The facility currently operates under a TVOP for various emission units associated with paper manufacturing. The facility also submitted miscellaneous RFDs for installing permit-exempt equipment. Kimberly-Clark routinely submits the required annual air emission inventories, the associated air permit fees, and annual and semiannual compliance certifications.

On November 2, 2009, the facility received a NOV for under reporting VOC emissions.

The USEPA has requested that the vapor intrusion pathway be evaluated as part of the EI process. The USEPA 2002 OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) provides a methodology for vapor intrusion evaluation under the current land use conditions using available site data. It should be noted that the USEPA 2002 guidance is not generally recommended for use in settings that are primarily occupational. However, the PADEP Land Recycling Program Technical Guidance Manual – Section IV.A.4 (Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard) can be applied to both residential and nonresidential receptors. This guidance provides decision matrices for soil and groundwater (under a Statewide Health, generic approach) for determining if indoor air quality may be of concern. Therefore, the PADEP Technical Guidance Manual was used, as deemed appropriate, to evaluate a potential vapor intrusion pathway in this report.

Extensive soil and groundwater investigations have occurred at the three AOCs, the No. 2 Fuel Oil Area, the Mill Area UST Removal Area, and the Penn Steel Area. Remedial activities have been conducted at the facility including excavation of contaminated soils, and extraction of SPL and contaminated groundwater. However, it was documented that some contaminated soil was left in place due to the presence of subsurface building structures and underground utility lines, and SPL remains in the subsurface in the No. 2 Fuel Oil Area and the Penn Steel Area. Buildings located in the vicinity of the No. 2 Fuel Oil Area include the buildings associated with the cogeneration plant, the raw water filter plant, and the other support buildings. The Mill Area UST Removal Area is situated directly adjacent to the mill buildings. Buildings located in the Penn Steel Area are primarily support structures for the coal handling/storage areas. There is a guard shack at the entrance to the Penn Steel Area that is occupied by a security guard 24 hours per day, seven days per week. Accordingly, the vapor intrusion pathway into onsite buildings that are used on a daily basis is a potential exposure pathway from soil and/or groundwater and warrants further evaluation.

Surface Water: The facility maintains nine outfalls that are permitted under NPDES permit PA0013081. Seven of the outfalls discharge stormwater runoff from the facility parking areas and rooftops to the Delaware River. One outfall (Outfall 001) is the emergency drain for the filter plant and is only opened during an emergency. Another outfall (Outfall 006) was recently diverted and no longer discharges to the Delaware River. The discharges are routinely monitored, and discharges above effluent limits are not expected. The facility's process wastewater as well as stormwater runoff in the Penn Steel Area is discharged directly to the DELCORA sewer system under permit. The discharges are routinely monitored, and discharges above effluent limits are not expected. Therefore, it is concluded that no additional controls are necessary for discharges of stormwater or industrial wastewater.

Contaminated groundwater has been identified at three specific locations on the facility property. At the No. 2 Fuel Oil Area and the Penn Steel Area, SPL remains in the subsurface. Groundwater data for downgradient wells in both of these areas in the 1990s suggested that contaminated groundwater was not discharging to the Delaware River from either of these areas. As previously discussed, the current chemical quality of the groundwater southwest of the No. 2 Fuel Oil Area source area (No. 6 fuel oil UST and bulkhead area) located approximately 150 feet of the Delaware River, and in the Mill Area UST Removal Area located approximately 500 feet upgradient of the Delaware River is currently unknown. Therefore, it is unknown whether contaminated groundwater is discharging to the Delaware River such that controls would be required.

Soil: There have been releases to soils at the facility resulting from the facility's leaking USTs and former historic operations unrelated to the facility (Penn Steel Area). These areas have been investigated. Contaminated soil and residual SPL was removed to the extent possible; however, some contaminated soil and SPL was left in place due to the presence of building foundations, underground utilities, and subsurface obstructions. In the No. 2 Fuel Oil Area, high TPH concentrations were detected in soil samples southwest of the recovery wells (SUMP-1 and SUMP-2). The highest concentrations were detected near the bulkhead, northeast of the No. 6 Fuel Oil AST during the 1989 and 1995 investigations. Sheens were also observed in groundwater infiltrating test pits in this area. No additional sampling was conducted in this area after cessation of the remediation system in 1996. Therefore, it is unknown whether soil is contaminated above appropriate regulatory levels or if SPL is present. This area is presently gravel-covered. One soil sample collected northwest of (upgradient to) the recovery wells in 1998 contained elevated concentrations of PAHs. The concentrations of the PAHs detected in this sample were generally below the PADEP used aquifer soil to groundwater non-residential MSC, except naphthalene which was detected above the MSC. This sample was collected beneath the asphalt-paved roadway.

Contaminated soil was also left in place in the Mill Area UST Removal Area. Although a dual-phase remediation system was proposed for this area, available documentation suggests it was not installed. Therefore, the current chemical quality of the soil is unknown. The majority of the excavation areas are gravel-covered. In the Penn Steel Area, SPL remains in the subsurface; however, the areas where SPL was observed are asphalt-covered.

It is not expected that contaminated soil or residual SPL would be easily accessible during daily operations. In addition, the facility is entirely fenced and continuously monitored by security, which further limits accessibility to potentially contaminated areas to authorized personnel. Therefore, it is not expected that additional controls are needed for daily operations. However, because some contaminated soil left in place may be shallow, additional controls may be required for subsurface work (i.e., utility work). A SMP is maintained at the facility for the Penn Steel Area. The SMP includes maintenance of the asphalt surface and security fence, and 24-hour security that limits access to authorized personnel.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)						
Contaminated Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater							
Air (indoors)							
Soil (surface, e.g., <2 ft.							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft.							
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

____ If no (there are current exposures that can be reasonably expected to be "unacceptable") - continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_____ YE – Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the Information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Kimberly-Clark PA, LLC** facility, EPA ID # **PAD002274991** located at **Front Street & Avenue of the States, Chester, PA 19013** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

_____ NO - "Current Human Exposures" are NOT "Under Control."

X IN - More information is needed to make a determination.

Completed by (signature) _____ Date _____

(print) _____

(title) _____

Supervisor (signature) _____ Date _____

(print) _____

(title) _____

(EPA Region or State) _____

Locations where References may be found:

USEPA Region III
Waste and Chemical Mgmt. Division
1650 Arch Street
Philadelphia, PA 19103

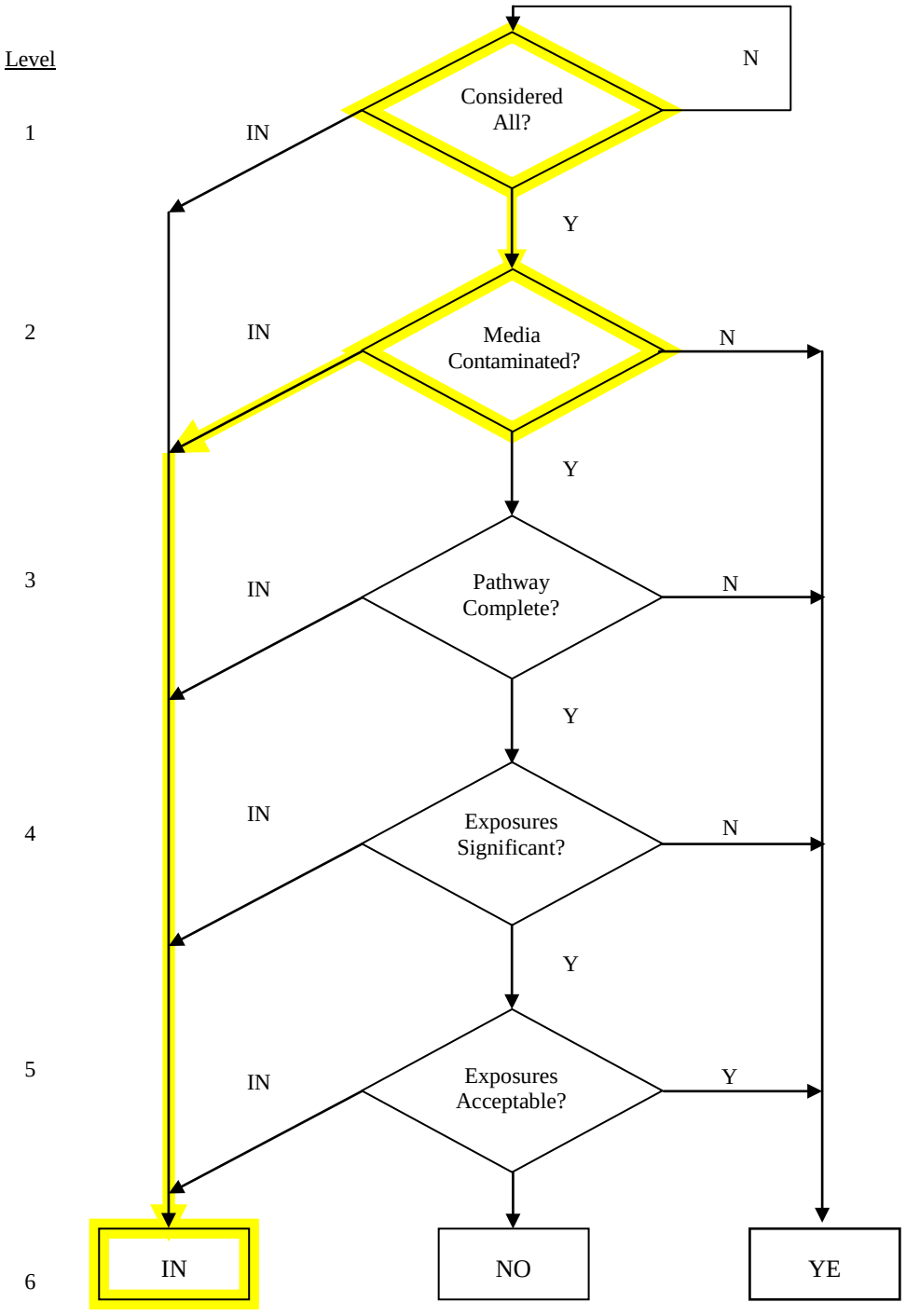
PADEP
South East Regional Office
2 E. Main Street
Norristown, PA 19401

Contact telephone and e-mail numbers
(signature) _____
(print) _____
(title) _____

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Facility Name:	Kimberly-Clark PA, LLC
EPA ID#	PAD002274991
City/State	Chester, PA 19013

CURRENT HUMAN EXPOSURES UNDER CONTROL (CA725)



United States Environmental Protection Agency
Region III
Corrective Action Program

Environmental Indicator Inspection Report
for

Kimberly-Clark PA, LLC
Front Street & Avenue of the States
Chester, PA 19013

EPA ID No. PAD002274991

Prepared By

November 2011

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LIST OF APPENDICES

RCRA SITE INSPECTION REPORT

Purpose: To gather relevant information from the Kimberly-Clark PA, LLC facility (Kimberly-Clark or facility), in order to determine whether human exposures and groundwater releases are controlled, as per Environmental Indicator (EI) Determination forms.

Documentation Review: Prior to the site visit, Michael Baker Jr., Inc. (Baker) personnel conducted an extensive records review of the Pennsylvania Department of Environmental Protection (PADEP) South East Regional Office (SERO) and the United States Environmental Protection Agency (USEPA) Region III Philadelphia Office files. Additional documentation related to the removal of the facility's underground storage tanks (USTs) and an updated listing of the facility's aboveground storage tanks (ASTs) was provided by Kimberly-Clark after the site visit.

Attendees at Site Inspection:

Name	Organization	Phone Number	E-Mail address
Gary Baker	Kimberly-Clark	610-499-6355	gfbaker@kcc.com
Kevin Orr	Kimberly-Clark	770-823-7721	kevin.orr@kcc.com
Mike McDonald	Kimberly-Clark	770-587-7120	michael.mcdonald@kcc.com
Einar Peters	Kimberly-Clark	610-499-6223	einar.peters@kcc.com
Jonathan Lorio	PADEP SERO	484-250-5749	jlorio@state.pa.us
Jennifer Wilson	PADEP SERO	484-250-5744	jewilson@state.pa.us
Tina Entenman	Baker	717-221-2061	tentenman@mbakercorp.com

Meeting Summary: A meeting was held at the facility with the attendees noted above on October 21, 2010. Ms. Entenman presented the facility with information regarding USEPA Region III's Corrective Action process, the EI Assessment Program and the legislation driving this program. Under this investigation, USEPA Region III is focusing on two interim EIs to evaluate whether any unacceptable risk to human health and/or the environment is ongoing at each priority facility. The two indicators are determining if human exposures are controlled and groundwater releases are controlled. Prior to and during the site visit, outstanding issues and discrepancies encountered in the file review summary were discussed.

The site visit continued with an overview of areas to be observed and a tour of the facility. Photographs of the facility were taken by Baker with permission of Kimberly-Clark and are presented in Appendix A: Photographs.

A. Location and Operational History of the Facility, Including all Wastes Generated at the Facility and their Management

Site Layout and Background Information

Site Layout

The facility is situated between State Route 291 and the Delaware River at the intersection of Front Street and Avenue of the States in Chester, Pennsylvania (Appendix B: Figure 1 - Facility Location Map). The facility's operating area consists of 74 acres that has a variety of buildings including process areas, plant offices, and final product storage and distribution warehouses, as well as a raw water filter plant, a cogeneration plant (power plant), and an outdoor coal pile storage and handling area (Appendix B: Figure 2 - Facility Layout). The majority of the operating area is covered with impermeable surfaces (i.e., buildings and asphalt-paved or concrete roads/parking lots); however, there are relatively small localized gravel areas throughout the property. These areas are located directly north of the mill building (Mill Area UST Removal Area), in the vicinity of the raw water filter plant (No. 2 Fuel Oil Area), and along the banks of the Delaware River. In the coal handling and storage area (Penn Steel Area), the western half of the surface consists of asphalt paving. The eastern half of the property is compacted gravel and coal, and the coal storage and handling structures. Topography at the site slopes gently toward the Delaware River with approximately six to 10 feet of relief from Front Street to the Delaware River. Access to the property is limited. A chain link fence surrounds the entire property. The facility is secured by a 24-hour guard service.

The area is an "enterprise zone" designated by the City of Chester planning commission. Other industrial/commercial areas are located adjacent to the facility along the Delaware River. Physician offices are located to the north, Harrah's Casino and Race Track are located directly east, and a highway maintenance department is located to the west of the facility. The Delaware River and the New Jersey/Pennsylvania border form the south/southeast boundary of the facility. Chester Creek flows through the property and separates the coal pile storage and handling area

from the facility's operational areas and the cogeneration plant. Kimberly-Clark owns the majority of the surrounding adjacent properties which are used primarily for parking.

Ownership History

Records indicate that the Chester Shipping Company, a ship building facility, operated some areas of the facility from the early 1900s until the 1940s (Atlantic Environmental Consulting Services, LLC [Atlantic, 2000]). Scott Paper Company (Scott) took ownership of the property and began operating in 1910. Chester Shipping Company continued to operate in several of the easternmost buildings until the 1940s.

Scott then merged with Kimberly-Clark Corporation in December 1995 and the name changed to Kimberly-Clark Tissue Company effective 1996. On December 15, 2000, the facility notified PADEP that Kimberly-Clark Tissue Company was to be liquidated and the assets were to be distributed to the parent company, Kimberly-Clark Corporation. The ownership and name changed to Kimberly-Clark Pennsylvania, LLC effective January 1, 2003. Collectively, these three entities will be referred to as Kimberly-Clark hereafter. Kimberly-Clark Pennsylvania, LLC continues to maintain operations to date.

Operations

Kimberly-Clark operates a non-integrated paper mill along the Delaware River in Chester, Pennsylvania, converting pulp into sanitary paper products such as tissues, towels, and napkins. Raw paper fiber is received at the facility via rail car or truck where paper machines press, decorate, and process these products.

The facility obtains its process water directly from the Delaware River via its raw water intake. The raw water is piped from the intake, through the wet well and into the raw water filter plant, where it is treated in three of four clarifiers. The raw river water is mixed with a polymer. The mixture is then gravity settled in sand filters. Clean water is then held in the mill water silo prior to use.

The facility operates a permit-by-rule (PBR) wastewater elementary neutralization system that treats spent sulfuric acid and sodium hydroxide from the demineralizer bed regeneration process in the raw water filter plant. The demineralizer system treats mill supply water (raw water drawn from the Delaware River and/or city water) prior to use as boiler feed water. Treated wastewater

(including water removed from the clarifiers during cleaning) generated at the facility is discharged into the Delaware County Regional Water Quality Control Authority (DELCORA) system under permit.

The facility also operates and maintains its own cogeneration power plant. The cogeneration power plant (Boiler No. 10) provides steam to the mill using anthracite culm mixed with bituminous coal that is obtained from the Poconos area of Pennsylvania. The culm is stored outdoors or in sheds directly on the ground surface in the Penn Steel Area, a 14-acre parcel located directly southwest of, and across Chester Creek from the mill area of the facility (Appendix B: Figure 2 - Facility Layout).

The Penn Steel Area was formerly utilized as a saw mill and coal yard until the late 1880s and as a steel casting facility by the Penn Steel Casting and Machine Company (Penn Steel),from the early 1890s into the 1960s (Atlantic, 2001). The western portion of the parcel was acquired by Scott in 1971 to undertake a Brownfield's initiative and return the abandoned industrial property into a functional entity of the facility. During the 1970s, Scott paved the Penn Steel Area and utilized it as a parking area for tractor trailers that stored finished goods prior to off-site shipment. In the 1980s, Scott developed the eastern half of the property as a coal pile storage and handling area that supports the cogeneration plant. Kimberly-Clark entered into a 100-year lease agreement with the City of Chester in 1985 for the eastern portion of the Penn Steel Area (Atlantic, 2001). The majority of the flat-lying surface of the Penn Steel Area is capped with asphalt and the remaining areas are covered with coal piles, buildings, and coal handling/sorting structures. A buffer zone of small trees and overgrowth lies between the fenced portion of the Penn Steel Area, and Chester Creek and the Delaware River.

There have been major investigations and remedial activities completed at three areas of the facility: (1) the No. 2 Fuel Oil Area located within the mill area, (2) the Mill Area UST Removal Area, and (3) the Penn Steel Area. Contaminated soil and groundwater were identified in each of the three areas. The facility has requested no further action determinations from PADEP for the No. 2 Fuel Oil Area and the Penn Steel Area; however, available records indicate that formal determinations have not been issued. (Note: These two areas of investigation were not formally entered into the PADEP Land Recycling Program [Act 2].) In addition, while a remediation system was proposed to treat contaminated soil and groundwater at the Mill Area UST Removal Area, facility representatives indicate that no response to the proposal was received from PADEP

and the remediation system was never installed. Further detail is documented in the *Investigations and Remedial Action to Date* section.

Waste Types and Quantities

According to the facility's historical waste permitting documents, hazardous wastes generated at the facility have included:

- D-listed wastes D001 (characteristically ignitable); D002 (characteristically corrosive); D003 (characteristically reactive); D007 (chromium); D008 (lead); D009 (mercury); and D039 (tetrachloroethene [PCE])
- F-listed wastes F001 and F002 (spent halogenated solvents) and F003, F004, and F005 (spent non-halogenated solvents)
- P-listed wastes P030 (cyanide) and P105 (sodium azide)
- U-listed wastes U002 (acetone); U044 (chloroform); U122 (formaldehyde); U144 (acetic acid/lead acetate); U154 (methanol/methyl alcohol); U159 (methyl ethyl ketone [MEK]); U226 (1,1,1-trichloroethane [TCA]); and U239 (xylene)

The facility currently operates as a small quantity generator (SQG), generating minor quantities of solvents and paint related wastes (brushes, rollers, empty paint cans, etc.). The facility also generates nonhazardous wastes including oil from machine maintenance, waste water-based polymers (glue), fluorescent/sodium vapor light bulbs and ballasts, baghouse wastes, wood wastes, refractory brick, and ash. The facility routinely submits biennial residual waste reports identifying these nonhazardous waste streams.

The paint-related wastes, waste oils, and glue are stored in 55-gallon drums or totes in Building 81 located on the east end of property. The hazardous wastes are stored in a caged area that consists of four bermed sections that are locked at all times. This area also stores empty 55-gallon drums. The light bulbs and ballasts are stored in a universal waste storage area located inside of the mill.

Reported Releases

According to the facility's January 2000 Pollution, Prevention, and Contingency (PPC) Plan, numerous releases have occurred at the facility. In April 1977, approximately 540 gallons of

concentrated sulfuric acid was spilled resulting from an overflow from the bulk sulfuric acid AST during filling by the supplier. The spilled acid was neutralized with soda ash and the area was washed. The resulting salts and debris were disposed of off-site. The facility constructed a dike around the AST and installed a high level alarm.

On September 19, 1980, a malfunction of the sulfuric acid dilution system occurred resulting in failure of several of the polyvinyl chloride (PVC) lines and the release of 2,200 gallons of 40 percent sulfuric acid. Some of the acid was spilled to the diked area and was pumped to the DELCORA system. The majority of the acid was released to a contained area covered with blacktop, some of which was pumped to the DELCORA system. The remainder of the spill was neutralized with soda ash. According to the PPC Plan (2000), DELCORA experienced low influent pH for approximately one hour; however, biological activity and effluent pH were not affected. The facility replaced all dilute acid lines with high temperature PVC lines, retrained the pump operators, and added a key lock to the acid fill pump startup button to prevent accidental startup of concentrated acid.

On March 23, 1981, approximately 10 gallons of waste oil was spilled into the Delaware River. The spill was reported to and followed up by the Coast Guard. No environmental damage was reported. The facility changed its truck washdown procedures to prevent recurrence and blocked a storm drain as a redundant measure.

On April 10, 1981, PADEP notified the facility of two unpermitted discharges to the Delaware River that included a release of six tons of suspended solids during a valve repacking operation on December 24, 1980 and a release of one ton of suspended solids during an electrical power failure on February 11, 1981. A penalty fee was proposed.

On July 19, 1983, approximately 20 gallons of a mixture of No. 2 and No. 6 fuel oil was discharged to the Delaware River via an external drain. The leaking oil was pumped from a containment area by a sump pump that failed after it was manually turned on to pump water out of the containment area. The spill was reported to the National Response Center (NRC) and followed up by the Coast Guard and PADEP. According to the PPC Plan, there was no known permanent environmental damage. The heat exchanger that facilitated the leak was replaced and monitoring procedures for pumping water from the containment area were revised.

On November 29, 1983, approximately 20 gallons of No. 2 fuel oil was discharged to the floor of the facility's generator building and the walk area outside of the building when an AST for a standby diesel generator was overfilled. Less than one gallon of No. 2 fuel oil was discharged to the Delaware River as a result of this spill. The incident was reported to the NRC and was followed up by the Coast Guard. The facility revised its operational procedures to prevent a recurrence.

On September 6, 1985, less than five gallons of oil was discharged to the Delaware River via Outfall 003. According to the PPC Plan (2000), the discharge was confined to the shoreline although a six-foot wide sheen that extended approximately 200 feet up-river was observed on the water surface. The facility deployed absorbent booms and pillows; however, the sheen was dispersed by wave action before it could be removed. The discharge was reported to NRC and PADEP. Later investigations could not determine the source of the discharge.

On May 20, 1988, approximately 7.5 gallons of diesel fuel and two gallons of lubricating oil were discharged to the Delaware River from Outfall 001. The facility placed absorbent booms in the river to collect as much oil as possible. The source for the diesel fuel could not be determined. However, the source for the lubricating oil was determined to be a failed seal in an air compressor that allowed the oil to enter the cooling water that was treated in the raw water filter plant.

In January 1989, No. 2 fuel oil was discovered leaking from a broken drain pipe. Although the fuel oil was leaking into the containment area of the AST, it was later discovered that the oil leaked through the containment area to a stormwater pipe (Outfall 001) and into the river. Oil was removed from the tank, containment area, and sump; and captive measures were approved by PADEP and the Coast Guard. Several days later, oil was discovered discharging to the Delaware River from beneath the facility's bulkhead. Although containment and cleanup efforts were implemented immediately, the discharge continued for several months during low tide. In January 1990, another discharge to the barge slip was observed. During excavation activities, a leak was observed in a 0.375-inch pipe, which was subsequently repaired. This release is discussed further in the *Investigations and Remedial Actions to Date* section. PADEP issued a notice of violation (NOV) for this release on September 26, 1990.

On July 29, 1991, approximately 6,000 gallons of diluted sulfuric acid was released to the ground surface as a result of a rupture in the discharge line of the dilute sulfuric acid AST. According to

the PPC Plan (2000), some of the impacted area was unpaved. None of the acid reached the nearby water bodies. The release was neutralized and collected, and the incident was reported to the NRC, PADEP, the Pennsylvania Emergency Management Association, and the Delaware County Hazardous Materials Advisory Council.

On April 17, 1992, a sheen was observed in Chester Creek by facility personnel. It was later determined that oil was dripping from an oil separator and mixed with stormwater resulting in a release of approximately one gallon of oil to the creek. The leaking equipment was removed from the facility and the incident reported to the NRC.

On May 18, 1993, approximately 600 gallons of low pH water (pH 5) from one of the sulfuric acid waste neutralization tank was found to be draining across the road and into the Delaware River. The facility notified the Coast Guard and PADEP visited the facility.

On July 3, 1999, approximately four gallons of hydraulic fluid was released to the Delaware River through drainage holes in the facility's pulp dock when a seal failed on a hydraulic motor on a conveyor. The incident was reported to PADEP; and the facility sealed all drainage holes in the dock under the conveyors.

On May 3, 2000, the facility notified PADEP that a discharge of water and a small amount of pulp fiber entered the Delaware River from a line in the wastewater elementary neutralization system. A leak in the line containing pulp fiber (concentration of approximately three percent in water) was discovered to be leaking at a rate of approximately five gallons per minute (gpm). It was estimated that 110 gallons were released including a non-hazardous polymer additive that was used to flocculate the pulp fiber in the wastewater elementary neutralization system. PADEP was immediately notified, and the facility repaired the line.

On March 23, 2001, the facility notified PADEP that a discharge of river water containing mud entered the Delaware River following an electricity outage. It was estimated that 5,000 gallons of river water containing 625 pounds of solids were released to the river via a storm drain after the valves in the clarifier located in the raw water filter plant failed to open. The only additives were reportedly two coagulation polymers.

On October 29, 2001, the facility notified PADEP that approximately 15 gallons of water

containing six pounds of paper fiber was discharged the Delaware River following blockage/overflow problems associated with one of the facility's paper machines and dissolved air filtration units. The water/pulp mixture was discharged to the floor of the building; however, some escaped through an open door and discharged directly to the river. PADEP was notified immediately, and the facility revised its procedures related to prevention and response to these types of incidents.

According to a letter dated August 9, 2006 from the facility to PADEP, a leak of sulfuric acid from the facility's former 8,000-gallon carbon steel AST was discovered on October 7, 2005. The AST was drained, taken out of service, and the concrete secondary containment area was cleaned and recoated. In December 2005, the carbon steel AST was removed and replaced with a 6,400-gallon polyethylene AST. On August 9, 2006, the facility notified PADEP that a sulfuric acid release occurred on June 7, 2006 resulting from a failed joint on the newly installed 6,400-gallon polyethylene AST. The concrete containment area that was designed to hold the entire contents of the old 8,000-gallon AST was cleaned and the walls recoated. The facility reported that while it was unlikely any acid escaped the containment area, the surface directly outside the containment area was asphalt-paved; therefore, there were no releases to soil, groundwater, or surface water reported. However, the facility noted that the asphalt area was cleaned up as a precaution. On July 7, 2006, PADEP issued the facility a NOV for the release. In an internal memorandum dated August 11, 2006, PADEP stated that there appeared to be no threat to human health or the environment; therefore, the release incident was closed.

On June 8, 2009, the facility notified PADEP of a June 5, 2009 release of sulfuric acid. Approximately 10-gallons of concentrated sulfuric acid were released from a loose fitting while filling the AST. There was reportedly no contamination to air, water, or land. The spill was contained and neutralized. Washwater generated during the cleanup was directed to the facility's wastewater elementary neutralization system. (Note: This AST is situated within a concrete secondary containment unit.)

An inventory of the documents and references used in this EI report is provided in Appendix C.

Permit and Regulatory Action History

Kimberly-Clark currently operates as a SQG facility under USEPA ID No. PAD002274991. The

facility also operates under a Title V Operating Permit (TVOP-23-0014) for air emissions, a National Pollutant Discharge Elimination System (NPDES) permit (PA0013081) for effluent outfall discharges, and a DELCORA Industrial Discharge Permit (1DE 01-04) for discharges of treated wastewater from the manufacture of sanitary paper products, river water clarification, and associated utilities.

Waste

On August 13, 1980, Scott submitted a Notification of Hazardous Waste Activity to USEPA for generation and treatment/storage/disposal (TSD) of hazardous wastes. With its submittal, the facility indicated it was filing as a TSD facility as a precautionary measure in the event wastes would accumulate beyond 90 days due to circumstances beyond its control. The facility was assigned USEPA ID No. PAD002274991 on October 9, 1980.

On November 14, 1980, the facility submitted a Part A Hazardous Waste Permit Application for storage of hazardous wastes in containers inside of Building 81 (Appendix B: Figure 2 - Facility Layout Map). Thirty-two (32) wastes codes were listed in the application. However, the facility indicated that 28 of the listed waste codes were actually raw materials used by the facility in the manufacturing process. The raw materials were listed as wastes in the event the materials would become wastes due to circumstances beyond the facility's control. The remaining four waste codes (USEPA Hazardous Waste Code F001, F002, F003, and F004 – spent halogenated and non-halogenated solvents) were actual wastes generated by the facility. USEPA acknowledged receipt of the Part A Hazardous Waste Permit Application on December 22, 1980 and again on July 27, 1981.

On September 9, 1981, PADEP confirmed the interim status facility was in violation of the regulations during the August 27, 1981 inspection at which time a waste determination was not available for the Safety-Kleen solvent utilized.

On March 4, 1983, PADEP formally requested the facility submit a Part B Hazardous Waste Permit Application (Part B); and on November 17, 1983, PADEP issued an NOV to the facility for not submitting the Part B. On November 21, 1983, the facility submitted a revised Notification of Hazardous Waste Activity to PADEP deleting TSD activity and notifying only as a generator of the following wastes:

- Spent halogenated solvents including F001 and F002 and non-halogenated solvents including F003, F004, and F005
- Acute hazardous wastes including P030 (cyanides) and P105 (sodium azide)
- Non-acute toxic wastes including U002 (acetone); U044 (chloroform); U122 (formaldehyde); U144 (acetic acid/lead acetate); U154 (methanol/methyl alcohol); U159 (MEK); U226 (TCA); and U239 (xylene).

On March 29, 1984, PADEP determined that the facility was not a TSD facility.

On April 24, 1986, USEPA requested a listing of any solid waste management units (SWMUs) at the facility.

On March 24, 1989, PADEP issued a NOV following the February 14, 1989 inspection for not having its wastewater elementary neutralization system permitted. The facility conducted elementary neutralization of raw water from the Delaware River and/or city water mill supply water as well as treatment of spent sulfuric acid and sodium hydroxide from the demineralizer bed regeneration process. The effluent was combined with the facility's sanitary wastewater and was discharged directly to the DELCORA system. Included with the NOV were the necessary forms and/or applications required to comply with PADEP's PBR status.

On October 19, 1994, the facility submitted a revised Notification of Hazardous Waste Activity to USEPA, notifying that the facility was a generator only and not a TSD facility. The notification form indicated the following wastes were generated by the facility:

- D-listed wastes including D001 (characteristically ignitable), D002 (characteristically corrosive), D003 (characteristically reactive), D007 (chromium), D008 (lead), D009 (mercury), and D039 (tetrachloroethene [PCE])
- F-listed wastes including F001 and F002 (spent halogenated solvents) and (F003 and F005) spent non-halogenated solvents
- P-listed wastes including P030 (cyanide)
- U-listed wastes including U044 (chloroform), U165 (naphthalene), U220 (toluene), and U239 (xylene)

On January 1, 2000, the PPC Plan was updated.

On May 15, 2003, the facility (now operating as Kimberly-Clark) submitted a notification letter to PADEP indicating that it was operating its cogeneration plant that used paper sludge as a fuel for the facility's primary boiler (Boiler No. 10) under PBR status. On July 29, 2003, PADEP approved PBR status for the cogeneration plant.

On February 23, 2004 and March 22, 2006, the facility submitted Residual Waste Reports (Form 26Rs) for various waste streams.

Air

Operating Permits

The facility currently operates under TVOP-23-0014 for various emissions sources associated with its paper manufacturing operations. The following table details the permits, issue dates, renewal information, and applicable inspections (which are discussed in more detail in the *Inspections* section) for the various plan approvals and operating permits issued to the facility throughout its operating history.

Plan Approval/ Operating Permit No.	Applicable Units	Date Issued	Notes	Compliant Inspections Dates from Available Records
Plan Approvals				
23-307-002	20" Experimental Paper Machine-Dryer with Hood Burners	July 31, 1996	Initially applied December 4, 1995 and subsequently renewed	
23-399-027	Two Converting Lines (with Two Fabric Filters and One Venturi Scrubber)	March 5, 1996	Initially applied in October 1995 and subsequently renewed	October 29, 1996
23-399-015	Ash & Fuel Handling Equipment for Boiler No. 10: Fuel Storage Pile, Unloading Structure, Crusher Tower, Fuel Silos, Limestone Silo, Ash Silos.	April 30, 1985	Subsequently renewed	

23-306-018	Circulating FBC Boiler (Boiler No. 10 RACT[(1)])	September 3, 1986	Prevention of Significant Deterioration (PSD)/Plan Approval April 25, 2003 Subsequently renewed	July 13, 1988, August 3, 1989
23-399-002	Two Direct Fired Air Heaters for No. 19 Paper Machine	December 11, 1986	Subsequently renewed	December 11, 1975, May 24, 1985, November 26, 1986, December 4, 1990, November 27, 1991, November 12, 1997
23-315-006	No. 16 Paper Machine-Dryer with Hood Burners	April 22, 1996	Subsequently renewed/extended	
23-315-006A	No. 12 & 17 Tissue Machines	March 31, 1995	Application submitted 1994. Subsequently renewed/ extended	February 22, 1996
23-315-008	No. 17 Paper Machine-Dryer with Hood Burners	November 25, 1997	Initially applied October 16, 1996 and subsequently renewed	
23-325-001	Bubble Application: Alternative Reduction Plan for Boilers No. 6-9	April 22, 1983		
23-302-062	Cleaver Brooks Boiler	November 22, 1976		April 3, 1978, July 9, 1980, May 25, 1983, May 29, 1985, July 31, 1986
23-399-008	Two Direct Fired Heaters	April 19, 1978	Subsequently renewed	June 1, 1979, May 22, 1980, June 3, 1981, July 21, 1993, October 23, 1995, August 23, 1998,
23-315-007	Paper Machine No. 18	August 8, 1996	Application submitted prior to April 19, 1996. Subsequently extended and	September 25, 1998

			renewed.	
Operating Permits				
OP-23-0014	General Operating Title V Permit for Facility: includes (VOC[2] and NOx[3] RACT) Boilers No. 8, 9, 10; Culm Cogeneration FBC[4] Plant, Paper Machines (7, 18, 19, 16, 12), Converting Areas, Cooling Towers, Storage Towers, Generators, Pulpers, Silos	July 31, 1995 Recently renewed on April 15, 2002	Boilers, paper production, ancillary equipment Minor Operating Permit Modification issued on November 13, 2001	July 28, 1998, October 27, 1999, October 16, 2001, April 17, 2003, May 16, 2003, February 3, 2005, March 14, 2005, April 26, 2007, May 4, 2007, May 29, 2007, July 10, 2009
OP-23-0014A/B	Extensions: RACT & NOx Budget		Combined into OP-23-0014	
OP-23-0014C	Plan Approval: Dust Collection for No. 17	December 3, 2002	Application submitted April 1, 2002. Combined into TVOP-23-0014	
OP-23-0014D	Extension: Machine Dryer No. 12 & Venturi Scrubber	May 22, 2003	Combined into TVOP-23-0014	
OP-23-0014E	Extension: Machine Dryer No. 16 & Hood Dryer	April 6, 2006	Combined into TVOP-23-0014	
OP-23-0014F	Extension: Ventilation System for PCMC[5] winders	November 14, 2006	Application submitted December 21, 2004 Extension granted February 18, 2009. Combined into TVOP-23-0014	

[1] RACT = Reasonably Achievable Control Technology
[2] VOCs = Volatile Organic Compounds
[3] NOx = Nitrogen Oxides
[4] FBC = Fluidized Bed Combustion
[5] PCMC = Paper Converting Machine Company

In addition to these permits, the facility routinely submitted the required annual air emission inventories and the associated air permit fees (available records indicate from 1997 to 2009).

Annual and semiannual compliance certifications were also submitted to PADEP (available records indicate from 2002 to 2009). Throughout its history, the facility also submitted miscellaneous Requests for Determination (RFDs) for installing permit-exempt equipment. On January 4, 1999, the operating permit was amended to include applicable NOx allowance requirements for emissions monitoring. A source emission test report for the No. 18 Paper Machine was prepared on September 1, 2000.

On December 15, 2000, the facility notified PADEP that Kimberly-Clark Tissue Company was to be liquidated and assets were to be distributed to the parent, Kimberly-Clark Corporation. It requested the appropriate transfer of permits. The facility also provided notice to the PADEP Air Quality Department on January 14, 2003 noting that the facility's ownership and name changed to Kimberly-Clark Pennsylvania, LLC effective January 1, 2003.

On August 23, 2001, the facility applied for a plan approval to conduct a trial burn period of tire derived fuel (TDF). This followed a three-day trial burn conducted between September 29, 1999 and October 1, 1999. On December 9, 2002, PADEP denied the plan approval to burn up to 8 percent TDF in Boiler No. 10.

On January 23, 2004, PADEP approved the request to decrease facility monitoring of malodor, fugitive, and visible emissions as required in the facility's operating permit. Since there were no related permit violations or public complaints, the request was granted.

On March 4, 2005, the facility provided initial notification for the installation of Boilers 8 through 10 in accordance with the Boiler National Emission Standard of Hazardous Air Pollutants (NESHAP) (subpart DDDD). On June 22, 2006, the facility provided the initial notification for the finished product tissue roll core-making process in accordance with NESHAP (subpart JJJJ).

On June 13, 2007, the facility requested that the Napkins Converting Area (emissions source 125F) be removed from the permit as it had been shutdown and removed.

Continuous Emission Monitoring Systems (CEMS)

As required by the TVOP, the facility is subject to requirements for CEMS. Available records indicate that the facility submitted quarterly emission reports from 1990 to 1999. The facility

first submitted the CEMS application on July 31, 1985 following the plan approval for the No. 17 Paper Machine Dryer.

In accordance with CEMS protocols, the annual Relative Accuracy Test Audit (RATA) and NOx Test Observation required completion. Records indicate that acceptable tests were conducted on February 24, 1989; February 24, 1995; January 24, 1997; September 30, 1998; October 21, 1999; September 1, 2000; and February 5, 2004. PADEP approved the Level IV system performance test on April 13, 1993. Compliant CEMS audits were conducted on March 11, 2005 and November 3, 2005. A CEMS Level II Field Systems Inspection was conducted on March 19, 1996.

Stormwater

NPDES Permit PA0013081

The facility currently operates under NPDES permit PA0013081 which initially included 16 stormwater outfalls. This permit was initially issued August 9, 1974 and has been subsequently modified and renewed throughout the facility's operational history. There are currently only nine permitted outfalls (Outfalls 001, 006, 008, 012, 013, 018, 016, 050, and 051). All but one are located on the Delaware River. Outfall 008 discharges to Chester Creek. Four of the 16 initially permitted outfalls were combined and renamed Outfall 050, which is the discharge for the DELCORA sewer main under Avenue of the States. Five of the 16 initially permitted outfalls were combined and renamed Outfall 051, which is the discharge for the DELCORA sewer main under Welsh Street. All outfalls receive stormwater from rooftops and/or parking areas except Outfalls 001 and 006, which are listed as process water outfalls.

Outfall 001 receives raw river water overflow, traveling screen wastewater, and cooling tower blowdown. This effluent may contain trace amounts of sodium bromide and sodium hypochlorite. Outfall 001 is the emergency drain for the filter plant and is only opened during an emergency. Outfall 001 is located at the north corner of the dock, directly south of the No. 2 fuel oil ASTs. Outfall 006 receives cooling tower blowdown from Building 95 and the cogeneration plant. Outfall 006 was recently diverted. The effluent from this outfall is recycled back into the filter plant. Outfall 006 no longer discharges to the Delaware River.

For the seven outfalls that do not discharge process wastewater (Outfalls 008, 012, 013, 018, 016, 050, and 051), permit PA0013081 includes effluent limits for total suspended solids, pH, oil and

grease, carbonaceous biochemical oxygen demand (CBOD), chemical oxygen demand (COD), total kjeldahl nitrogen (TKN), total phosphorous, and dissolved iron. Effluent limits for Outfalls 001 and 006 include flow, total suspended solids (TSS) (both raw intake water and effluent), free available chlorine, total residual oxidant, temperature, and pH.

On July 12, 1996, at the facility's request, PADEP consolidated several historical industrial permits (including Industrial Waste Permits 766I013, 1643, 1961, and 1126) into Permit PA0013081. The individual industrial waste permits were issued for specific industrial wastewater streams.

On December 19, 2002, the facility made notification that on January 1, 2003, all of the assets of Kimberly-Clark Corporation's Everett, Washington facility would transfer from the parent company (Kimberly-Clark Corporation) into Kimberly-Clark Pennsylvania, LLC. Thus, the facility requested to transfer permit PA0013081 from Kimberly-Clark Corporation to Kimberly-Clark Pennsylvania, LLC. On June 19, 2003, PADEP notified the facility that NPDES permit PA0013081 and Part II permits 1643, 1126, 1961, and 766I013 were transferred to Kimberly-Clark Pennsylvania, LLC.

The facility applied for permit renewal on December 5, 2005. PADEP acknowledged receipt of the application on February 6, 2006. The permit was reissued April 2, 2007 and expires on April 30, 2012.

Pollution Minimization Plan

On December 8, 2004, the Delaware River Basin Commission (DRBC) sent notice to the facility that additional monitoring for polychlorinated biphenyls (PCBs) would be required for facilities with NPDES permits that did not contain PCB monitoring requirements. The additional monitoring was required to assist DRBC with development of Stage 2 Total Maximum Daily Load (TMDLs) for PCBs in the Delaware Estuary. The letter outlined specific sampling protocol to be followed by the facility to fulfill the requirement.

On June 30, 2005, the DRBC notified the facility of the established Pollutant Minimization Plan (PMP) requirements for applicable facilities. Additional notification was made on December 29, 2005. The facility provided the PMP for PCBs to DRBC on August 8, 2007. It noted that in 1991 there were 16 PCB-containing transformers that were located in areas with appropriate

containment measures. By 2007, all but three of the transformers were properly removed and disposed, and the facility had no PCB-contaminated electrical equipment at that time. (Note: According to a USEPA inspection in 1990, the facility once had 36 PCB-containing transformers. During the 2010 site visit, facility representatives stated that as of 2009, all PCB-containing transformers were removed from the facility.) There were reportedly no leaks or releases from the transformers to the local storm sewer system. However, the PMP indicates that sampling of stormwater at one of the facility's outfalls (Outfall 029 located near the northeast corner of the facility's raw water filter plant) on three separate occasions identified the presence of low concentrations of PCB congeners. The facility concluded that the source of the PCBs was likely the adjacent railroad operations as the facility's closest PCB-containing transformer had no reported leaks and was situated within secondary containment inside of a building until it was removed in 2001. The facility intended to pressure wash the brick-lined storm drain (Outfall 029) prior to the next PCB sampling event.

On February 25, 2008 and February 25, 2009, the facility submitted copies of the PMP annual report to PADEP and DRBC. The stormwater samples collected at Outfall 029 in November 2007 indicated an increase in both the number of PCB congeners and the concentration of total congeners. Stormwater samples collected in December 2008 showed an increase in the number of PCB congeners but a decrease in the concentration of total congeners. The total mass loading of PCBs to the Delaware River for wet days and the average mass baseline load for all days calculated by the facility remained relatively constant between sampling events (0.45 milligrams per day [mg/day] and 0.15 mg/day, respectively). The facility maintained that a possible source for the PCBs identified at Outfall 029 was the adjacent railroad or air deposition. However, the facility indicated that it planned to remove the remaining three PCB-containing transformers by 2010. In addition, the facility indicated an additional round of stormwater sampling would be conducted at Outfall 029 in 2009.

On September 21, 2009, DRBC notified the facility that under the Stage 1 TMDLs, additional monitoring would be required to better characterize loadings of PCBs to the Delaware Estuary.

NPDES Permit PAR140016

Records indicate that on October 2, 1996, PADEP issued a renewal for NPDES permit PAR140016 for discharges of stormwater to Chester Creek and the Delaware River. Under this permit, the facility was subject to the Appendix J monitoring requirements and effluent limits

(CBOD, COD, oil and grease, pH, TSS, TKN, total phosphorous, and dissolved iron). This permit was superseded by NPDES permit PA00130891.

DELCORA Permit 1DE 01-04

The facility currently holds a permit to discharge processed wastewater from the manufacture of paper products, river water clarification, and associated utilities from three outfalls (identified as Outfalls 101, 101A, and 101B) to the DELCORA sewer system. Outfall 101 is a combination of Outfall 101A (industrial process flow) and 101B (raw water). The permit is valid from May 22, 2007 through May 21, 2011. According to the permit, the discharges include industrial flow from a dry well and raw water clarification solids ('river mud') from the facility's raw water filter plant. Effluent limits must be met at Outfall 101 for flow, BOD, COD, total organic carbon (TOC), total petroleum hydrocarbons (TPH), pH, temperature, total halogenated organics (TOX), total phenols, total cyanide, and total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc). At 101A and 101B, effluent limits must be met for TSS; pentachlorophenol; trichlorophenol; total aluminum, copper, lead, zinc, cyanide, and phenols; priority pollutant metals; VOCs; acid/base/neutral extractables; pesticides/PCBs; volatile suspended solids; as well as flow, BOD, COD, pH, and temperature.

According to facility representatives, two stormwater basins located within the Penn Steel Area collect stormwater runoff from within the coal yard. The basins are periodically pumped out and the water is discharged to the DELCORA system under this permit.

Other Permits

Encroachment Permit

On December 16, 1996, a Joint Water Obstruction and Encroachment Permit (E23-348) was issued through the United States Army Corps of Engineers (USACE) and PADEP. The permit allowed the placement of fill (745 cubic yards) beneath an existing low deck pier structure that supported the facility's cooling tower, 1.68 million gallon No. 6 fuel oil AST, and a fuel lines. This fill placement followed the discovery of earth fallout into the riverbed near the AST along the Market Street pulp deck.

B. Description of all Solid Waste Management Units (SWMUs) and/or Areas of Concern (AOCs)

SWMUs

A November 14, 1994 PADEP/USEPA joint multimedia inspection noted the following locations where hazardous wastes were generated:

- The maintenance shops where two parts cleaners used Safety-Kleen products (hazardous waste codes D001, D006, D007, D008, D018, D021, D027, D035, D039, and D040). The parts washers were maintained by Safety-Kleen. According to the inspection report petroleum naphtha and monoethanolamine solvents were used in the parts washers prior to 1993. The facility discontinued the use of the hazardous solvents and began using non-hazardous solvents in its parts washers in 1993.
- Obsolete chemical lab packs (hazardous waste codes D001, D002, D005, D007, D008, D009, U044, U220, and U239)
- The wastewater elementary neutralization system where spent sulfuric acid and sodium hydroxide from the demineralizer bed regeneration process was generated (hazardous waste code D002)
- Paint shop where flammable waste paint-related materials were generated
- Dirty Lube Oil Tank 052

During the 2010 site visit, facility representatives indicated that wastewater and solids generated from the clarification process in the raw water filter plant are discharged to DELCORA system under existing permit 1DE 01-04.

Hazardous wastes are drummed and stored at the permitted hazardous waste accumulation area located in Building 81. The hazardous waste accumulation area consists of a 24 foot by 32 foot area on the concrete floor that is enclosed by a six-inch high concrete curb and a six-foot high chain link fence. At the time of the site visit, six 55-gallon steel drums of hazardous wastes that included paint wastes (rollers, cans, brushes), waste glue, and waste oil, were stored in the accumulation area along with approximately 20 new empty 55-gallon drums. Five totes, 13 steel and fiberboard drums, and several five-gallon buckets of nonhazardous waste were stored directly

adjacent to (outside) of the fenced accumulation area. Facility representatives indicated that there are no satellite storage areas for hazardous wastes.

One additional storage area was identified inside of the mill. This area is used for accumulation of universal wastes (e.g., non-PCB ballast, fluorescent light bulbs, and mercury containing thermostats). During the 2010 site visit, several fluorescent light bulbs and one drum containing several ballasts were stored in this area.

AOCs

Based on the available regulatory documentation reviewed for this EI report, three AOCs have been identified. These include the No. 2 Fuel Oil Area, the Mill Area UST Removal Area, and the Penn Steel Area. Each of these AOCs is described in detail in the *Investigations and Remedial Actions to Date* section. (Note: Subsurface contamination identified at the Penn Steel Area was determined to be a result of past operations conducted by Penn Steel, not a result of the facility's operations.)

Storage Tanks

A Spill, Prevention, Control and Countermeasure (SPCC) Plan was prepared on July 10, 1974 in which it was stated that the facility used four separate types of oil including fuel oil, process chemicals, lubricating oils, and hydraulic oils. Fuel oil was delivered to the plant via barge and was used to fire boilers that generated steam to dry the paper products. Process chemicals consisting of emulsified mineral oil, xylene, and kerosene were delivered to the facility in bulk via tanker trucks. Lubricating and hydraulic oils were received at the facility in 55-gallon drums. The SPCC Plan was subsequently updated throughout the years, most recently in October 2000.

Tank registrations were submitted to PADEP throughout the course of operation. On February 23, 2001, PADEP acknowledged receipt of the application for the facility to obtain a General Operating Permit (GOP) for registered tanks noting a facility ID of 23-06536.

Tank inspections were periodically conducted. Compliant inspections include: July 9, 2002, August 27, 2002, April 19, 2004, March 16, 2005, and October 8, 2007.

ASTs

On October 26, 1990, the facility sent a list of ASTs to PADEP. The facility provided an updated list in January 2011. The updated list of ASTs is presented in the following table:

AST Tank No.	Capacity (Gallons)	Last Known Contents	Current Contents	Location	Status
001	3,000	Phosphoric Acid	NA	NA	Demolished
002	45,000	Caustic Soda	NA	NA	Demolished
003	13,000	Aluminum Glycol	NA	NA	Demolished
004	3,000	Ethylene Glycol	NA	NA	Removed
005	3,000	Urea Formaldehyde	NA	NA	Removed
006	10,000	Kymene	NA	NA	Removed
007	10,000	Kymene	NA	NA	Removed
008	10,000	Crepetrol	NA	NA	Removed
009	2,500	7% Metlamine	NA	NA	Removed
010	2,500	7% Metlamine	NA	NA	Removed
011	6,000	Accostrength 85	NA	NA	Removed
012	9,000	Amine	NA	NA	Demolished
013	9,000	Formaldehyde	NA	NA	Demolished
014	9,000	Formaldehyde	NA	NA	Demolished
015	10,000	Sulfuric Acid	NA	NA	Removed
016	10,000	Talc	NA	NA	Removed
017	12,000	Sodium Hypochlorite	NA	NA	Removed
018	10,200	Sulfuric Acid	NA	NA	Removed
019	45,000	Sodium Hypochlorite	NA	NA	Removed
020	1,650	Sodium Hypochlorite	NA	NA	Removed
021	1,500	Accostrength 85	NA	NA	Removed
022	1,500	Accostrength 85	NA	NA	Removed
023	4,500	Defoamer	NA	NA	Removed
024	6,000	Print Fluid	NA	NA	Removed
025	6,000	Print Fluid	NA	NA	Removed
026	4,500	Dilute Defoamer	NA	NA	Removed
027	4,500	Starches 4441 and 5472	NA	NA	Removed
028	4,500	Accostrength 85	unknown	Main Mill, 1st Floor, TM19 Basement	
029	7,000	Silicone HV-490	Kymene	Main Mill, 1st	In-Service

				Floor, TM19 Basement	
030	4,500	Starches 4441	NA	NA	Removed
031	4,000	Accostrength 85	NA	NA	Removed
032	4,500	Starch 4441	NA	NA	Removed
033	4,500	Starch 5559	NA	NA	Removed
034	4,500	Starch 5472	NA	NA	Removed
035	4,000	Monoammonium Phosphate	Monoammonium Phosphate	Main Mill, 1st Floor, TM17 Chemical Kitchen	In-Service
036	4,000	Amasoft	Dry Strength Additive	Main Mill, 1st Floor, TM17 Chemical Kitchen	In-Service
037	4,000	Release Agent 565	Dry Strength Additive	Main Mill, 1st Floor, TM17 Chemical Kitchen	In-Service
038	3,000	Accostrength 85	NA	NA	Removed
039	3,000	Accostrength 85	NA	NA	Removed
040	8,000	Kymene	NA	NA	Removed
041	8,000	Crepetrol	NA	TM18 Basement	Removed
042	2,500	Kymene	Empty	Main Mill, 1st Floor TM16 W/E	Out-of-Service
043	2,500	Kymene	Empty	Main Mill, TM16 Basement	Out-of-Service
044	2,500	Crepetrol	Empty	Main Mill, TM16 Basement	Out-of-Service
045	2,500	Crepetrol	Empty	Main Mill, TM16 Basement	Out-of-Service
046	1,000	Resin Cleaning Tank	Resin Cleaning Tank	CCF, Building 92, 1st Floor	In-Service
047(2)	8,000	Caustic Soda	Caustic Soda	---	In-Service
048	8,000	Sulfuric Acid	NA	CCF, Building 92, 1st Floor	Removed
049	1,000	Brine	Brine	CCF, Building 92, 1st Floor	In-Service
050	2,000	Lube Oil	Lube Oil	CCF, Building 92, 2nd Floor	In-Service
051	3,500	Clean Lube Oil	Clean Lube Oil	CCF, Building 92, 1st Floor	In-Service
052	3,500	Dirty Lube Oil	Dirty Lube Oil	CCF, Building 92, 1st Floor	In-Service
053	103,880	No. 6 Fuel	NA	NA	Demolished
054	103,880	No. 6 Fuel	NA	NA	Demolished
055	103,880	No. 6 Fuel	NA	NA	Demolished

056[(2)]	163,920	No. 2 Fuel	No. 2 Fuel	NA	In-Service
057[(2)]	163,920	No. 2 Fuel	No. 2 Fuel	---	In-Service
058[(2)]	1,680,000	No. 6 Fuel Oil	No. 6 Fuel Oil	---	Temporarily Out-of-Service [(1)]
059	6,000	Dry Strength Resin	NA	NA	Removed
060	6,000	Dry Strength Resin	NA	NA	Removed
061	7,000	Latex Mixture	Kymene	Main Mill, 1st Floor, TM19 Basement	In-Service
062	7,000	Dry Strength Resin	CMC	Main Mill, 1st Floor, TM19 Basement	In-Service
063	5,000	Waste Treatment Polymer	Tissue Machine Broke	Main Mill, 22 Building, 1st Floor	In-Service
064	1,000	Waste Treatment Polymer	Empty	Main Mill, Waste Treatment, Polymer Basement	Out-of-Service
065	1,000	Waste Treatment Polymer	Empty	Main Mill, Waste Treatment, Polymer Basement	Out-of-Service
066	500	Diesel Oil	Diesel Oil	Coal Yard	In-Service
067	1,000	Diesel Oil	Diesel Oil	Utilities, #2 Power House	In-Service
068	1,500	Water Treatment Polymer	Water Treatment Polymer	Utilities, Filter Plant, 2nd Floor	In-Service
069	1,500	Alum	Empty	Utilities, Filter Plant 2nd Floor	Out-of-Service
070	500	Diesel	NA	NA	Removed
071	15,000	Lube/Spare/Waste Oil	Lube/Spare/Waste Oil	Main Mill, TM17 Basement	In-Service
073	8,000	Kymene	Kymene	Main Mill, 1st Floor, Chemical Receiving	In-Service
074	8,000	Kymene	Kymene	Main Mill, 1st Floor, Chemical Receiving	In-Service
075	1,300	Acti-Brom 1318	Acti-Brom 1318	Utilities, Filter Plant, 1st Floor	In-Service
077	550	Diesel Fuel	Diesel Fuel	Utilities, #2 Power House, Back-up	In-Service

				Generator Room	
078	1,200	Elimin-Ox	Elimin-Ox	CCF, 1st Floor, Water Treatment Area	In-Service
079	1,200	Tri-Act 1826	Tri-Act 1826	CCF, 1st Floor, Water Treatment Area	In-Service
080(2)	1,200	Nalco Trasar	Nalco Trasar	---	In-Service
081	250	Gasoline	NA	NA	Removed
084(2)	5,090	Caustic Soda	Caustic Soda	---	In-Service
085	5,090	Defoamer	Defoamer	Main Mill, 1st Floor, Chemical Receiving	In-Service
086	5,090	Charge Control	Empty	Main Mill, 1st Floor, Chemical Receiving	Out-of Service
087	5,090	Empty	Empty	Main Mill, 1st Floor, Chemical Receiving	Out-of-Service
088(2)	6,400	Sodium Hypochlorite	Sodium Hypochlorite	---	In-Service
089(2)	6,400	Sodium Hypochlorite	Sodium Hypochlorite	---	In-Service
090	5,090	Crepetrol	NA	Main Mill, 1st Floor, Chemical Receiving	Out-of-Service
091(2)	905	Nalco Biocide	Nalco Biocide	---	In-Service
092(2)	1,400	Sodium Hypochlorite	Sodium Hypochlorite	---	In-Service
092(3)	5,090	Hercobond 1366	Hercobond 1366	Main Mill, 1st Floor, Chemical Receiving	Empty
093(2)	6,000	Sulfuric Acid	Sulfuric Acid		In-Service
093(3)	5,090	Hercobond 1366	Hercobond 1366	Main Mill, 1st Floor, Chemical Receiving	Empty
NA	Unknown	Brine Tank	Empty	Main Mill, Basement, between TM12 and Stores	Out-of-Service
NA	10,000	Talc	Talc	Main Mill, 2nd Floor, behind TM16	In-Service

CCF – Chester Cogeneration Facility

(1) This tank is scheduled to be dismantled when funding is complete.

(2) Tank currently registered.

(3) Tank was registered with PADEP in 2000 with this ID. No longer registered or in use.

On September 24, 1990, the facility notified PADEP of the planned removal (demolition) of

ASTs 001, 002, 003, 012, 013, 014, 053, 054, and 055. On January 29, 1997, the facility notified PADEP that Tank 040A (8,000 gallons of Kymene) was removed. On January 14, 2002, PADEP notified the facility that the closure of Tank 076A and installation of Tank 094A was completed by an uncertified tank installer. On November 18, 2002 and January 15, 2003 the facility notified PADEP that a certified tank handler would remove Tanks 019A and 082A.

According to facility representatives, there are currently 35 in-service ASTs at the facility. Of the 35 ASTs, 11 are registered with PADEP. Per the 2010 site visit, the facility and PADEP are working together to determine tank registration status. These include the two No. 2 fuel oil ASTs (Tanks 056 and 057) and the 1.68 million gallon No. 6 fuel oil AST (Tank 058). The remaining eight registered ASTs contain the chemicals used by the facility's wastewater elementary neutralization system. Per the 2010 site visit, the facility indicated the No. 6 fuel oil AST (Tank 058) was scheduled to be decommissioned in November 2010 by removal of the remaining contents and cleaning/dismantling the tank; however, as of November, the facility was waiting for funding to be complete. The tank has been drained, cleaned and supply/return lines blanked and the manway covers are bolted open.

USTs

Records indicate that 10 USTs were present at the facility. Information related to the capacity, contents, and removal of the USTs is presented on the following table.

Facility ID No.	UST Capacity (gallons)	UST Contents	Location	UST Removal Date
UT#1(A)	12,000	Xylene	North of Buildings 20 and 21	August 16, 1989
UT#1(B)	12,000	Xylene	North of Buildings 20 and 21	August 16, 1989
UT#2	10,000	Kerosene	North of Buildings 20 and 21	September 14, 1989
UT#3	8,800	Emulsified Mineral Oil	North of Buildings 20 and 21	September 11, 1989
UT#4	10,000	Fuel Oil	By #2 Power House	Closed-in-place with sand prior to 1989
UT#5	825	Diesel Fuel No. 2 Fuel Oil	By #2 Power House	August 15, 1989
UT#6	20,000	No. 6 Fuel Oil	Under #1 Power House	Closed-in-place with Perma-Fill Foam - September 4, 1991
UT "A"	550	Gasoline	Northeast of	September 29, 1989

			Buildings 20 and 21	
UT "B"	10,000	No. 2 Fuel Oil "Penn Shipbuilding Company" area	West side of building along Morton Street	December 1996
---	Unknown	Waste Oil	East of Buildings 20 and 21	September 1, 1989

According to the UST Removal Report prepared by Buchart-Horn, Inc. (Buchart-Horn, 1989), six USTs (UT#1(A), UT#1(B), UT#2, UT#3, UT "A", and the waste oil UST) were located outside (north and east) of the mill building near the facility's main entrance. An additional UST containing No. 2 fuel oil (UT#5) was located adjacent to (east of) Building 35 by the #2 Power House. These seven USTs were excavated and removed from the site. A 20,000 gallon UST containing No. 6 fuel oil (UT#6) was located beneath the floor of the #1 Power House. For safety and logistical concerns, this UST was cleaned and filled in place with foam with PADEP approval dated April 26, 1991. Removal of these USTs is presented in detail in the *Investigations and Remedial Actions to Date* section. According to facility representatives, there are currently no USTs remaining on-site.

At the 2010 site visit, facility representatives stated that two other USTs (UT#4 and UT "B") were either closed-in-place or removed. On December 2, 1996, Environmental Control Systems, Inc. (ECS) coordinated the removal of UT "B", a 10,000-gallon No. 2 fuel oil tank, from the area of the facility referred to as the "Penn Shipbuilding Company" area located along Morton Avenue on the northeast corner of the facility's property (Appendix B: Figure 1 - Facility Location Map). Details provided in a Site Assessment and Closure Report dated January 14, 1997, indicated that no obvious contamination was observed. Groundwater was encountered at nine feet below ground surface (bgs) in the excavation. Two post-excavation samples were collected from the north and south ends of the excavation at the soil/water interface, and two groundwater samples were collected from the excavation. The soil samples were analyzed for benzo(a)anthracene, benzo(a)pyrene, naphthalene, fluorene, and phenanthrene. The groundwater samples were analyzed for benzene, toluene, ethylbenzene, xylenes, and naphthalene. None of the constituents analyzed for were detected above laboratory detection limits. The excavation was backfilled with the excavated soil and the area was repaved.

No additional information was available for the closure of UT#4; however, the facility representatives stated that this UST was closed-in-place using sand prior to 1989.

Investigations and Remedial Actions to Date

Asbestos Removal Actions

On October 29, 1980, an asbestos inspection was conducted during removal of an out-of-service paper machine. The asbestos-containing materials (ACM) removal was found to be in accordance with the asbestos NESHAP regulations (Subpart M).

On May 3, 1988, the facility submitted notification forms to USEPA for pending ACM removal projects in which greater than 260 linear feet of ACM (pipe and tank insulation).

ACM removal is an ongoing project at the facility. According to facility representatives, Kimberly-Clark spends approximately $300,000 per year in ACM removal activities.

Subsurface Investigations

There have been major soil and groundwater investigations and remedial activities completed at three AOCs at the facility property. These include the No. 2 Fuel Oil Area, the Mill Area UST Removal Area, and the Penn Steel Area. The following presents discussions of the investigation activities.

No. 2 Fuel Oil Area

According to the Final Report for the No. 2 Fuel Oil Area prepared by Atlantic for the facility in April 2000, numerous investigations and remedial activities were conducted in the No. 2 Fuel Oil Area beginning in 1989. Only the reports prepared by Triegel and Associates, Inc. (Triegel) dated November 9, 1989 and January 22, 1990, and the Oil Spill Remediation Plan letter report prepared by the facility dated July 16, 1990 were in found in the regulatory files and are discussed in detail below. The remaining investigation activities were summarized in Atlantic's Final Report (2000). Accordingly, the details of these investigations as summarized in the following sections are from the Final Report (Atlantic, 2000) unless otherwise noted.

Triegel, Subsurface Soils Investigation – November 9, 1989: In February 1989, a leak was identified from the discharge line of a No. 2 fuel oil AST. The leak breached the containment area of the AST, migrated along a stormwater pipe, and discharged to the Delaware River at Outfall 001. Although the total quantity of No. 2 fuel oil that discharged to the river was unknown, approximately 100 to 200 gallons were recovered by the facility during immediate

response activities. On October 3, 1989, Triegel initiated a subsurface soil and groundwater investigation in the No. 2 Fuel Oil Area at the request of the facility (Appendix B: Figure 3 - Soil Sample Locations). The investigation included drilling and sampling of six soil borings (TB-1 through TB-6) and installation of one groundwater monitoring well located immediately downgradient from the release. The soil borings ranged in depth from 10 to 16 feet bgs. The samples were collected from depths ranging between six and 12 feet bgs. The nature of the soil was loose fill (clayey silt with rock, brick, and coal fragments situated above natural dark gray silt; a soil layer that is naturally high in organic content and was referred to in the Triegel report as "meadow mat").

Field screening of the soils was conducted using an organic vapor analyzer/gas chromatograph (OVA/GC). GC spikes were indicative of naturally occurring VOCs and no GC peaks related to fuel oil (benzene, toluene, ethylbenzene) were found above the detection limits of 10 parts per million (ppm). TPH concentrations detected in the soil ranged from 180 to 8,900 milligrams per kilogram (mg/kg). Conclusions from Triegel's report suggested that the highest TPH concentration (8,900 mg/kg detected in sample TB-5) was believed to be in part due to the subsurface conditions and unrelated to the No. 2 fuel oil spill. This interpretation was based on the fact that TB-5 was the farthest boring from the spill (located greater than 200 feet south of the spill location); the intermediate borings (TB-3 and TB-4) were relatively clean; the soil sample collected from TB-5 did not contain visible evidence of oil contamination; and shallow groundwater flow was expected to be to the southeast, directly from the spill location to the Delaware River and would be unlikely to flow to the south in the direction of TB-5.

Only one monitoring well (MW-1) was installed due to the limited horizontal extent of visual contamination and the presence of numerous utilities (overhead and underground) and building structures. The four-inch diameter well was installed at boring location TB-6, which was the only location where significant oil contamination was observed during the soil investigation. The well was 13 feet deep and was screened from 3 to 13 feet bgs. Separate-phase liquid (SPL) measuring approximately 0.375 inches thick was encountered in the monitoring well. A groundwater sample collected from the well was analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX); and petroleum fuels. The analytical results for the groundwater sample were compared to the USEPA Drinking Water Standards Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs). Benzene, detected at 20 milligrams per liter (ug/l), was the only compound exceeding the MCL of 5 ug/l. The concentrations of the other

dissolved-phase petroleum constituents (toluene – 20 ug/L, ethylbenzene – 80 ug/L, and total xylenes – 370 ug/L) were less than their respective MCLGs. The report was submitted to PADEP on November 9, 1989 and proposed two options for remediation of the spill: 1) recover product from the subsurface by pumping, and 2) continue recovering product in the barge slip using existing absorbent booms.

Triegel, Backhoe Trench Investigation Report – January 22, 1990: On January 17, 1990, a trench investigation was conducted by Guardian Environmental Services, Inc (Guardian) in response to the recurring discharge of oil from the bulkhead area to the barge slip. Four trenches were excavated on the north side of the No. 6 fuel oil tank along the length of the bulkhead. The trenches were excavated down to just below the water table. The depths of the trenches ranged from six to 11 feet bgs. Crushed concrete and coarse gravel comprised the upper one foot of soil, and sand and fine gravel of varying color comprised the soil to the trench bottom. Soils exhibited an oil odor and a sheen formed on the groundwater seeping into the trenches.

A void space identified below a buried wooden deck had accumulated oil and was releasing it to the barge slip at low tide. Triegel collected a sample of the oil observed floating on the water in the void space, and a sample of the oil from the absorbent booms used in the barge slip to contain the oil release. The samples of the oil were submitted to a laboratory for a GC fingerprint analysis to identify the oil. The analytical results indicated that the oil in barge slip and the oil observed in the void space encountered during the excavation activities were No. 2 fuel oil.

Triegel, Oil Spill Remediation Plan – July 16, 1990: An Oil Spill Remediation Plan was submitted by the facility to PADEP on July 16, 1990. Initially, the release of No. 2 fuel oil was attributed to a leak from a corroded discharge line to one of the No. 2 fuel oil ASTs. However, the remediation plan states that during excavation activities to install new equipment in the area, facility personnel noticed the 0.375-inch diameter barge unloading pipeline connecting the No. 2 fuel oil pump house to the barge unloading station was leaking. Although the pipeline was infrequently used, the oil had been leaking and slowly accumulating around the bulkhead, eventually finding paths through void spaces and seeping into the barge slip. Guardian was retained to conduct and maintain daily cleanup activities until the oil discharge subsided. At the time, Guardian was also maintaining the absorbent booms in the river on a weekly basis. The report also cited the implementation of a groundwater remediation system and the proposal to solicit bids for a bioremediation system for soils.

According to the Final Report (Atlantic, 2000), installation of the groundwater remediation system began in April 1990. Two recovery wells (24 inches in diameter and 12 feet deep) were installed in the area of the western bulkhead of the barge dock (Appendix B: Figure 3 - Soil Sample Locations). The fluids (oil/water mixture) pumped from the recovery wells (identified as SUMP-1 and SUMP-2) were passed through an oil water separator, where the product was skimmed off and sent to a 500 gallon holding tank. The effluent was then sent to a second oil/water separator within the facility's process wastewater stream. The treated water was directed to the wastewater elementary neutralization system, which ultimately discharged to the DELCORA system under permit.

The groundwater remediation system began operation in March 1991 and operated intermittently until 1995 when the facility requested the recovery operations be discontinued. During its operation, the remediation system influent and effluent were analyzed for TPH concentrations (1991 and 1992) and oil and grease (1993 through 1995). The analytical results for oil and grease, and the absence of measurable product indicated that the remediation system was effectively removing the SPL and dissolved-phase constituents from the groundwater. Therefore, in late 1993, the initial oil/water separator was removed from the system and the influent from the recovery wells was pumped directly into the facility's wastewater stream.

In December 1994, samples of the remediation system effluent showed that BTEX constituents were no longer present in groundwater at the No. 2 Fuel Oil Area. This data, along with consistently low oil and grease concentrations and the absence of SPL prompted the facility to request approval from PADEP to discontinue operation of the remediation system in April 1996. PADEP responded in August 1996 requesting an additional round of groundwater samples from the recovery wells to be analyzed for the parameters specified in the 1996 PADEP UST Closure Guidance Document. The groundwater sample collected in August 1996 was analyzed for BTEX, naphthalene, and methyl tert butyl ether (MTBE). Only MTBE was detected at a concentration of 2.2 ug/L, which was below the PADEP used aquifer, total dissolved solids less than 2,500 mg/L, non-residential medium specific concentration (MSC) (Atlantic, 2000).

Based on this sample data, the facility again requested approval from PADEP to discontinue operation of the groundwater remediation system in September 1996. After a site meeting between the facility and PADEP in July 1997, PADEP approved a temporary suspension of the groundwater remediation system. However, PADEP indicated that additional soil sample data

collected in accordance with the Act 2 guidance would be required in order for the facility to obtain a no further action determination for the No. 2 Fuel Oil Area (Atlantic, 2000).

Smith Environmental Technologies Corporation – February 1995: According to the Final Report (Atlantic, 2000), the facility retained Smith Environmental Technologies Corporation (Smith) to conduct additional investigations to assess soil and groundwater conditions after the completion of the groundwater remediation system operation. In February 1995, Smith installed two four-inch diameter monitoring wells (MW-1 and MW-11) in the No. 2 Fuel Oil Area (Appendix B:Figure 3 - Soil Sample Locations). Monitoring well MW-1 was installed to replace existing well MW-1 installed in 1990. Monitoring well MW-11 was installed to confirm that the SPL was confined to the area of MW-1 and that downgradient groundwater quality was not impacted by the SPL in MW-1. The wells were installed to depths of 10.5 feet bgs (MW-1) and 9.5 feet bgs (MW-11) with five-foot screened intervals.

In addition, Smith collected six soil samples, two of which were collected from the monitoring well boreholes (SB-1 through SB-5, and SB-7, Appendix B: Figure 3 - Soil Sample Locations). The soil samples were analyzed for diesel range organics (DRO) and BTEX. (Note: The tabulated data presented in the Final Report [Atlantic, 2000] indicates the soil samples were analyzed for BTEX and TPH.) TPH concentrations in the soil samples ranged from 306 mg/kg to 12,000 mg/kg. The highest TPH concentrations were detected at SB-4 (12,000 mg/kg), SB-5/MW-11 (5,160 mg/kg), SB-7 (2,460 mg/kg), and SB-1/MW-1 (1,240 mg/kg). BTEX concentrations were less than the laboratory detection limit or where measurable, were less than the PADEP direct contact and soil to groundwater used aquifer non-residential MSCs as described by Atlantic in the Final Report (2000).

The two soil samples collected from the monitoring well boreholes also were submitted for laboratory analysis of microbiological parameters including heterotrophs, hydrocarbon utilizers, TKN, orthophosphate, moisture content, pH, and iron. The analytical results for the microbiological samples indicated that active microbial populations were present, nitrogen and phosphate were available, and conditions were suitable for growth of microbes. Therefore, it was concluded that conditions were favorable for biodegradation/attenuation of the residual hydrocarbons in the soil.

Roux Associates, Inc. (Roux), Investigations – 1997 and 1998: According to the Final Report

(Atlantic, 2000), following a September 1997 request from PADEP, the facility retained Roux Roux to complete additional investigation work at the No. 2 Fuel Oil Area. The additional work included an assessment of the SPL remaining near MW-1, collection of additional soil samples, and collection of additional groundwater samples.

In March 1997, weathered SPL was observed in MW-1 but not in MW-11 or in either of the two recovery wells. To evaluate the potential recovery rate and thickness of the SPL, MW-1 was vacuumed (by truck) once a week for four consecutive weeks in June and July 1997, and the groundwater disposed of offsite. The oil/water mixture recovered slowly to the well between each evacuation event. The exact thickness of the SPL could not be determined. In January 1998, Roux used a drum vacuum assembly to extract SPL from MW-1 to evaluate the potential for removal prior to implementing a soil removal action. Again, SPL slowly recovered to the well between evacuation events. The apparent SPL thickness was determined to be 0.01 feet.

In December 1997, an exploratory test pit was dug near MW-1, where petroleum impacted soils were encountered at three feet bgs (Appendix B: Figure 3 - Soil Sample Locations). Approximately 10 cubic yards of contaminated soil was removed during the excavation and transported offsite for recycling. Soils in the north, east, and west sides of the excavated area did not appear to be impacted. The south side of the excavation was bound by a concrete foundation wall that extended to the water table, which was believed to have limited the migration of SPL beyond the vicinity of MW-1. Soils between MW-1 and the No. 2 fuel oil AST containment wall (west side of the excavation as shown on Figure 3) could not be excavated due to the presence of the overhead pipe rack and the containment wall. One post-excavation soil sample (PE-1) was collected near MW-1 and was analyzed for polynuclear aromatic hydrocarbons (PAHs). Benzo(a)anthracene (0.63 mg/kg), benzo(a)pyrene (0.58 mg/kg), and phenanthrene (0.7 mg/kg) were detected in the sample. According to the Final Report (Atlantic, 2000), the concentrations of the detected PAHs were below the PADEP direct contact and soil to groundwater used aquifer non-residential MSCs. TPH were also detected in sample PE-1 at 13 mg/kg.

In January 1998, Roux drilled three additional soil borings (identified as SS-1, SS-2, and SS-3) (Appendix B: Figure 3 - Soil Sample Locations) east of the barge slip in the vicinity of the highest historical TPH concentrations (boring SB-4 drilled by Smith in 1995). One soil sample was collected from each boring approximately six inches above the water table. Each soil sample was analyzed for naphthalene, fluorene, benzo(a)anthracene, benzo(a)pyrene, and phenanthrene.

According to the Final Report (Atlantic, 2000), the three soil samples contained: benzo(a)anthracene (two samples, 0.97 to 1.5 mg/kg), benzo(a)pyrene (two samples, 1.1 to 1.6 mg/kg), naphthalene (one sample, 0.081 [J] mg/kg), fluorene (two samples, 0.068 [J] to 0.31 mg/kg), and phenanthrene (three samples, 0.15 to 2.4 mg/kg) that were below the PADEP direct contact and soil to groundwater used aquifer non-residential MSCs (Atlantic, 2000). The concentrations of residual petroleum constituents decreased in the downgradient (southeast) direction. In addition, TPH concentrations decreased from 12,000 mg/kg identified in sample SB-4 collected by Smith in 1995 to 10 mg/kg in sample SS-1 drilled at the same location. TPH were also detected in samples SS-2 and SS-3 at 17 mg/kg and 18 mg/kg, respectively.

During the soil sampling activities, Roux also collected groundwater samples from MW-11, the two recovery wells (SUMP-1 and SUMP-2), and temporary well point GW-1 (Appendix B : Figure 3 - Soil Sample Locations). The groundwater samples were analyzed for BTEX and naphthalene. None of the constituents analyzed for were detected above laboratory detection limits in any of the four groundwater samples. This was consistent with historical data; therefore, it was concluded that groundwater quality downgradient from MW-1 was effectively remediated through intermittent operation of the groundwater remediation system between 1991 and 1996.

In December 1998, Roux drilled six additional soil borings (B-1 through B-6) (Appendix B: Figure 3 - Soil Sample Locations) to delineate the extent of soil containing residual petroleum constituents in the No. 2 Fuel Oil Area. According to the Final Report (Atlantic, 2000), the six soil samples contained petroleum-related constituents including ethylbenzene (two samples, 0.082 to 1.2 mg/kg), cumene (three samples, 0.14 to 1.4 mg/kg), naphthalene (three samples, 0.15 to 61 mg/kg), fluorene (six samples, 0.31 to 94 mg/kg), and phenanthrene (six samples, 1.0 to 220 mg/kg) that were below the PADEP direct contact and soil to groundwater used aquifer non-residential MSCs. The highest concentrations were detected in soil sample B-5 collected from a depth of eight feet bgs beneath the asphalt-paved area. The concentration of naphthalene (61 mg/kg) detected in sample B-5 exceeded the used aquifer soil to groundwater non-residential MSC; however, the concentration was below the direct contact and soil to groundwater nonuse aquifer non-residential MSCs (Atlantic, 2000). Furthermore, it was concluded that because naphthalene was not detected in the groundwater samples collected from the two recovery wells located downgradient of sample B-5, the elevated concentration of naphthalene in soil sample B-5 was not degrading groundwater quality in the No. 2 Fuel Oil Area.

Atlantic, Final Report – April 2000: To further support the facility's request for a no further action determination in the No. 2 Fuel Oil Area, Atlantic collected one groundwater sample in direct contact with the SPL from MW-1 in July 1999, and analyzed it for the PADEP Short List of Petroleum Products for fuel oil Nos. 2, 4, 5, and 6. The sample contained benzene (0.3 [J] ug/L), cumene (1.5 ug/L), fluorene (2 [J] ug/L), and phenanthrene (3 [J] ug/L) at concentrations below the PADEP used aquifer TDS less than 2,500 mg/L non-residential MSCs. Based on this information, Atlantic concluded that the SPL in MW-1 was not adversely impacting groundwater quality. In addition, as compared to the 1989 groundwater data for MW-1, the concentrations of petroleum-related constituents generally decreased below laboratory detection limits.

On April 21, 2000, the facility submitted the Final Report for the No. 2 Fuel Oil Area prepared by Atlantic to PADEP in which the following findings were presented:

- Operation of the groundwater remediation system between 1991 and 1996 and the removal of petroleum-impacted soil in the vicinity of MW-1 to the extent practicable resulted in a reduction in the thickness of SPL to less than 0.1 inch. In addition, the presence of a concrete barrier in the downgradient direction and the viscosity of the SPL limited migration of the remaining SPL beyond the area of MW-1.

- Groundwater samples collected between 1989 and 1999 showed a decrease in concentration of petroleum-related constituents below laboratory detection limits and/or below the PADEP used aquifer non-residential MSCs in wells downgradient of MW-1 and in groundwater in direct contact with the SPL collected at MW-1.

- No domestic or agricultural wells were located near or within the facility, and the impacted area was not located within a Zone 2 wellhead protection area. Furthermore, the Chester Water Authority, the local public water supplier, obtained all of its water supply outside of the Chester County boundary.

- Soil samples collected since 1989 indicated that detected petroleum-related constituents were present below the MSCs except naphthalene in one soil sample. However, direct contact exposure to low level residual petroleum in soil was eliminated because the area is covered entirely by asphalt and ballast, and access is limited to facility personnel.

Based on this information, Atlantic concluded that no further action was warranted for the No. 2 Fuel Oil Area, and the facility requested a no further action determination from the PADEP.

During the 2010 site visit, facility representatives indicated that they have received no response from PADEP regarding their request for a no further action determination, and have, therefore, left the monitoring wells open for future monitoring, if required.

Mill Area UST Removal Area

Buchart-Horn, Inc., UST Removal Report – November 6, 1989: On May 15 and September 29, 1989, the facility notified the Pennsylvania State Police Fire Marshall and the Chester Fire Department that eight USTs were closed or in the process of being closed. Between August and October 1989, seven USTs were removed and one UST was closed-in-place in the mill area under the direction of Buchart-Horn, Inc. (Buchart-Horn) and facility representatives (Appendix B: Figure 4 - Groundwater Contour Map). These USTs stored No. 2 fuel oil, No. 6 fuel oil, gasoline, kerosene, waste oil, emulsified mineral oil, and virgin xylene (two separate USTs). During the removal and/or closure of the USTs, contaminated soil and groundwater were encountered, which was the result of holes observed in the USTs, and reported spills and overfills. The report estimated that the UST removal contractor excavated a total of 1,295 cubic yards of contaminated soil and temporarily stored the soil in the Penn Steel Area of the facility until it could be analyzed and disposed of properly.

Soil samples collected from the excavations were analyzed for one or more of the following: petroleum hydrocarbons; ethylbenzene; toluene; xylenes; total organic halogens; metals; and base neutrals. Excess levels of petroleum hydrocarbons and xylenes were detected in all seven excavation areas as detailed below. Ethylbenzene and toluene were also detected in some excavations but below the reported petroleum hydrocarbon concentrations. (Note: The report did not indicate the exact locations and/or depths of the samples collected in the excavations or the constituents comprising the petroleum hydrocarbons concentrations.) Tidal fluctuations affecting the groundwater at the facility, in addition to the presence of nearby known and unknown underground utilities, structures, and building footers made the removals of the USTs and the contaminated soil difficult. During higher tide periods, groundwater was observed with a sheen or thin layer of product, seeping back into the bottom of the excavations. The report noted that substantial soil and groundwater remediation efforts would be required subsequent to removal of the USTs.

No. 2 Fuel Oil UST – This UST, located near Building 35, was removed over several weeks in August 1989. Extensive contamination was observed to a depth of approximately eight feet bgs

on the south and west sides of the excavation and to a depth of approximately six feet bgs on the north and east sides. Contaminated soil was removed to the extent possible; however, due to the presence of a water main on the south side of the excavation, a pipe carrying unknown contents on the north side of the excavation, and the footer to the boiler house, some contaminated soil was left in place. In total, 130 cubic yards of contaminated soil was excavated. Three soil samples were collected from the excavation. Petroleum hydrocarbons were present in the first sample (depth and location not stated) at 490 mg/kg. Petroleum hydrocarbons (3,100 mg/kg) were also present in a composite sample of the excavated soils, and in a sample collected from the side walls of the excavation (880 mg/kg). In addition, m-xylene was detected in the composite sample (90 micrograms per kilogram [ug/kg]) and the side wall sample (30 ug/kg). The excavation was immediately backfilled due to safety concerns.

Xylene USTs – Removal of the two xylene USTs was completed in August 1989. These two USTs were located directly north of Buildings 20 and 21 (Appendix B: Figure 4 - Groundwater Contour Map). A combined total of 460 cubic yards of contaminated soil was removed from the excavations. Groundwater filled the emptied tank during removal of the fiberglass UST. Buchart-Horn collected a sample of this groundwater as well as a composite sample of the excavated soil. Petroleum hydrocarbons (1,300 mg/L), total xylenes (150,000 ug/L), and ethylbenzene (18,000 ug/L) were identified in the groundwater sample; and petroleum hydrocarbons (1,200 mg/kg), total xylenes (15,000 ug/kg), and ethylbenzene (2,000 ug/kg) were detected in the composite soil sample.

The second xylene UST contained approximately 100 gallons of xylene liquid. In addition, the UST was approximately two-thirds full of sand, holes were discovered in several places on the sides of the UST, a high pressure gas line crossed the UST, shallow soil contamination was identified, and explosive concentrations of xylenes vapors were measured. Buchart-Horn collected a sample of the liquid and sand inside of the UST as well as a composite sample of the excavated soil. The liquid contained 0.87 percent toluene, 69 percent total xylenes, and 20 percent ethylbenzene. The sand contained petroleum hydrocarbons (70 mg/kg), total xylenes (1,750,000 ug/kg), and ethylbenzene (350,000 ug/kg). The composite soil sample contained petroleum hydrocarbons (620 mg/kg), toluene (400 ug/kg), total xylenes (450,000 ug/kg), and ethylbenzene (112,000 ug/kg). The excavations for both USTs were immediately backfilled due to safety concerns.

Kerosene UST – The kerosene UST, located directly north of Buildings 20 and 21 and east of the xylenes USTs, was removed in September 1989. The UST was previously filled with sand. Approximately 200 cubic yards of contaminated soil was excavated until clean conditions were encountered. Two post-excavation soil samples were collected from the excavation. In addition one sample of the sand inside of the UST, one sample of the liquid inside of the UST, and one groundwater sample from the excavation were collected. The results indicated that:

- The initial post-excavation soil sample contained petroleum hydrocarbons (150 mg/kg); total xylenes (2,450 ug/kg); and ethylbenzene (270 ug/kg). The second post-excavation soil sample collected after additional contaminated soil was excavated contained petroleum hydrocarbons (90 mg/kg); total xylenes (290 ug/kg); and ethylbenzene (40 ug/kg).

- The sand inside of the UST contained petroleum hydrocarbons (80 mg/kg) and m-xylene (40 ug/kg); and the liquid inside of the UST contained petroleum hydrocarbons (5.7 ug/L).

- The groundwater sample collected from the excavation contained petroleum hydrocarbons (4,200 mg/L); total xylenes (1,950 ug/L); and ethylbenzene (10 ug/L).

Emulsified Mineral Oil UST – The emulsified mineral oil UST, located directly north of Buildings 20 and 21 and directly east of the kerosene UST, was removed in September 1989. Approximately 245 cubic yards of soil was removed. Due to the level of the groundwater in the excavation, no further soil excavation was conducted near this UST. Two soil samples were collected from the bottom of the excavation. Petroleum hydrocarbons (50 mg/kg); toluene (14,000 ug/kg); ethylbenzene (8,800 ug/kg); o-xylene (30 ug/kg); and m-xylene (30 ug/kg) were detected in the samples. A liquid sample was also collected and analyzed for metals and base neutrals of which none were detected.

Waste Oil UST – Removal of the waste oil UST, located directly east of Buildings 20 and 21 and south of the emulsified mineral oil UST occurred in September 1989. Approximately 50 cubic yards of soil was removed. A composite sample of the excavated soil was collected which contained petroleum hydrocarbons (4,600 mg/kg); total xylenes (430 ug/kg); and ethylbenzene (90 ug/kg). Two liquid samples also were collected that contained total organic halogens (81.4 mg/kg) and petroleum hydrocarbons (63 percent). (Note: The sources for the liquid samples

were not stated in the report.)

Gasoline UST – The gasoline UST, located northeast of Buildings 20 and 21, was removed in September 1989. The UST was previously filled with sand. Approximately 75 cubic yards of soil was removed until clean conditions were observed. Four soil samples were collected that included a pre-excavation sample, a sample of the sand inside of the UST, and post-excavation sample from the excavation walls. Petroleum hydrocarbons were present in the sand (40 mg/kg); the pre-excavation sample (380 mg/kg); and the post-excavation sample (80 mg/kg). Toluene (70 ug/kg), total xylenes (230 ug/kg), and ethylbenzene (50 ug/kg) also were detected in the pre-excavation sample.

No. 6 Fuel Oil UST – The No. 6 fuel oil UST was located beneath the boiler room floor. The UST was emptied of its contents; however, Buchart-Horn recommended the UST remain in-place to maintain stability of the surrounding structures. No additional work was completed related to this UST at that time.

Groundwater Technology Inc. (GTI), Hydrogeologic Assessment – June 1990: On October 26, 1989, PADEP requested the facility submit a work plan to determine the extent of soil and groundwater contamination related to the closure of the mill area USTs. On April 2, 1990, the facility submitted the requested work plan prepared by GTI to PADEP. Investigation activities proposed in the work plan included a soil gas survey near the former xylenes USTs, installation of a minimum of eight groundwater monitoring wells, collection of additional soil samples, a complete assessment of the aquifer properties, and a minimum of three rounds of groundwater sampling. In addition, on-site treatment using air-driven bioremediation of the contaminated soil and sand materials stockpiled in the Penn Steel Area was proposed.

On May 11, 1990, the facility submitted an interim report to PADEP describing the investigation work completed by GTI. On June 1, 1990, the facility submitted the Hydrogeologic Assessment report prepared by GTI which described the installation of nine four-inch diameter monitoring wells (MW-2 through MW-10), collection of nine soil samples, and collection of three rounds of groundwater samples. One monitoring well was installed adjacent to each of the former UST locations, and one well was installed as an upgradient background well as described below and shown on Appendix B: Figure 4 - Groundwater Contour Map.

- MW-2 was installed near the former No. 6 fuel oil UST.
- MW-3 was installed near the former waste oil UST.
- MW-4 was installed near the eastern former xylenes UST.
- MW-5 was installed near the former kerosene UST.
- MW-6 was installed near the former mineral oil UST.
- MW-7 was installed near the former gasoline UST.
- MW-8 was installed near the western former xylene UST.
- MW-9 was installed near the main entrance to the facility on Second Street.
- MW-10 was installed near the former No. 2 fuel oil UST.

The wells were installed to a maximum depth of 15 feet bgs. One soil sample (either the highest PID reading or nearest the water table) was collected from each monitoring well borehole during drilling. Samples were collected at depths ranging from four to 12 feet bgs (generally collected between five and seven feet bgs). The soil samples were analyzed for one or more of BTEX; PCBs; and TPH. The soil materials encountered during drilling consisted of fly ash fill (dark gray to black silt and clay), stone aggregate (backfill in tank removal areas), and orange-brown sandy fill material. River deposits consisting of reddish brown sand and gravel were encountered only below a depth of 12 feet bgs.

BTEX constituents were not detected in the soil samples except sample MW-5 (10 to 12 feet bgs) where ethylbenzene (120 mg/kg) and xylenes (590 mg/kg) were detected, and sample MW-4 (five to seven feet bgs) where xylenes (1.4 mg/kg) were detected. PCBs (0.59 mg/kg) were detected in sample MW-3 (4 feet bgs). This was the only sample analyzed for PCBs. TPH were detected in samples MW-2 (420 mg/kg as kerosene at five to seven feet bgs), MW-5 (480 mg/kg as kerosene), and MW-7 (490 mg/kg as lube oil at five to seven feet bgs).

Three rounds of groundwater samples were collected from the newly installed monitoring wells. Existing well MW-1 located in the No. 2 Fuel Oil Area was used as an additional monitoring point. The groundwater samples were analyzed for one or more of BTEX and TPH. The analytical results are presented in the following table. None of the constituents analyzed for were detected at MW-10 during any of the three sampling events.

Well ID	Constituent	Maximum Concentration (ug/L)	Frequency of Detection
MW-2	TPH (as lube oil)	63	1/3
MW-3	Toluene	45	1/1
	Xylenes	93	1/1
	TPH (as kerosene)	12,000	3/3
MW-4	Benzene	6.4	1/2
	Toluene	6.5	1/2
	Ethylbenzene	32	2/2
	Xylenes	120	2/2
	TPH (as gasoline)	25	1/1
	TPH (as xylenes)	130	2/2
	TPH (as kerosene)	2,900	3/3
MW-5	Benzene	3.7	1/3
	Ethylbenzene	500	3/3
	Xylenes	8,800	3/3
	TPH (as gasoline)	240	1/1
	TPH (as xylenes)	4,400	2/2
	TPH (as kerosene)	2,400	3/3
MW-6	Benzene	0.5	1/2
	Toluene	0.5	1/2
	TPH (as kerosene)	86	1/3
MW-7	Benzene	0.8	1/3
	TPH (as gasoline)	15	1/3
MW-8	Benzene	43	1/2
	Toluene	25	1/2
	Ethylbenzene	1,500	1/2
	Xylenes	2,600	1/2
	TPH (as gasoline)	690	1/1
	TPH (as xylenes)	3,600	2/2
	TPH (as kerosene)	12,000	3/3
MW-9	Benzene	0.8	3/3
	Ethylbenzene	7	1/3
	Xylenes	40	2/3

Depth to groundwater across the facility ranged from three to five feet bgs. Based on the groundwater elevations, GTI concluded the regional and local groundwater flow direction was toward the Delaware River. However, it was suggested that the presence of large areas of asphalt and the extensive basement complex beneath Buildings 20 and 21 that intersected the water table redirected shallow groundwater flow at the facility to the east and possibly to the north as a result of mounding associated with the presence of the backfill materials in the tank excavations.

Based on the results of the investigation, GTI concluded that due to the high percentage of silt and clay in the underlying soils, groundwater flow and contaminant migration would be relatively slow. Furthermore, the sources for the hydrocarbon contamination were removed and there were no users of groundwater in the vicinity of the facility.

On May 23, 1990, the facility submitted a letter to PADEP proposing permanent closure of the No. 6 fuel oil UST by filling it with Perma-Fill Foam material. On June 5, 1990, PADEP requested a plan regarding details on how the facility planned to remediate the soil and groundwater contamination related to the leaking USTs. The facility responded on June 27, 1990 stating that additional soil borings and monitoring wells were proposed to further investigate the waste oil UST area and that in-situ bioremediation was planned for remediation of the soils and groundwater in the vicinity of the former kerosene and xylene USTs. The facility also stated that no further action was proposed for the former gasoline and former No. 6 fuel oil UST areas.

PADEP responded on September 20, 1990, stating that the facility's proposed closure of the No. 6 Fuel Oil UST was deficient because only one groundwater monitoring well was installed and sampled in the vicinity of the UST. On September 25, 1990, following review of GTI's Hydrogeologic Assessment report and the proposed remediation plan submitted by the facility on June 27, 1990, PADEP requested a remedial action plan for the TPH contaminated soil at the former gasoline and No. 6 fuel oil UST areas and a site-wide groundwater monitoring plan. On November 14, 1990, the facility responded noting that GTI was planning to drill two additional soil borings, and install one additional monitoring well.

In a letter dated April 26, 1991, PADEP concurred with the facility's plan to close the UST in place. The letter stated that four quarters of groundwater sampling of three wells for TPH and BTEX must be completed at which time; PADEP would make a determination if further monitoring was needed. On July 29, 1991, the facility sent a letter to PADEP stating that it had retained the services of BCM Engineers, Inc, (BCM) to complete the remediation project.

BCM, Remedial Investigation and Cleanup Plan for the Former Underground Storage Tank Areas – August 1991: In August 1991, BCM prepared the Remedial Investigation and Cleanup Plan for the Former Underground Storage Tank Areas. It summarized the UST removals and investigation activities noting that ethylbenzene and xylenes were present in the soils and groundwater surrounding the former xylene and kerosene UST areas; concentrations of TPH with

boiling points within the kerosene range were present in the soils and groundwater in this area; and PCBs were present in the soils surrounding the former waste oil UST. The report stated that concentrations of ethylbenzene, xylenes, and TPH in groundwater decreased since 1989 indicating the constituents were naturally degrading and that PCBs were not of concern in groundwater near the former waste oil UST. The report was submitted to PADEP by the facility on September 11, 1991, and included recommendations for operation of a two-phase vacuum extraction system for contaminated soil and groundwater in the UST area.

According to a letter dated September 26, 1991, the No. 6 fuel oil UST had been filled with inert Perma-fill foam, and groundwater monitoring of three wells around the UST had been initiated. The analytical results for sampling events conducted in September and December 1991 and June 1992 for these wells showed that BTEX and TPH were not present in groundwater above laboratory reporting limits except TPH at MW-3 during the September 1991 sampling event. On July 17, 1992, the facility requested a no further action determination from PADEP relative to the No. 6 fuel oil UST. According to the USEPA/PADEP joint inspection report dated April 25, 1995, there was no action by PADEP at the time of the joint inspection.

Penn Steel Area

During construction activities for the coal storage and handling structures in the Penn Steel Area in the 1980s, SPL was encountered in the subsurface soil within the footprint of the former steel foundry operations. In 1985, the facility voluntarily initiated environmental activities in the Penn Steel Area, completing the majority of the site work prior to 1995. The following is a summary of those investigations as summarized in the Final Report for the Penn Steel Area prepared by Atlantic, dated December 2001.

Roux, 1985: Roux was retained by the facility to conduct a soil and groundwater investigation that included excavating 17 test pits; drilling 15 soil borings; installing five piezometers and seven permanent groundwater monitoring wells (ranging in depth from 15 to 64 feet bgs); and conducting a tidal survey and aquifer permeability tests. Soil and groundwater samples were analyzed for VOCs, SVOCs, base neutral extractable compounds (BNs), and acid extractable compounds (AEs). SPL was identified in the vicinity of MW-5 and MW-7 (Appendix B: Figure 5 - Residual Separate-Phase Product Investigation Points). Globules of residual product were observed in test pits and soil borings installed downgradient from MW-5.

Three soil samples were collected from areas where SPL was known to be present to focus on potential worst case concentrations in soil. The samples were analyzed for VOCs and SVOCs. Methylene chloride (one sample, 0.1 mg/kg), fluorotrichloromethane (two samples, 0.2 and 1.4 mg/kg), bis(2-ethylhexyl)phthalate (two samples, 0.7 and 10 mg/kg), di-n-butyl phthalate (one sample, 0.6 mg/kg), fluoranthene (one sample, 1.2 mg/kg), fluorene (one sample, 2.4 mg/kg), phenanthrene (two samples, 2 and 3 mg/kg), and pyrene (two samples, 0.5 to 3.1 mg/kg) were detected in the soil samples.

Methylene chloride (four samples, 11 to 280 ug/L), 1,1-dichloroethane (one sample, 5 ug/L), benzene (one sample, 26 ug/L), ethylbenzene (one sample, 6 ug/L), fluorotrichloromethane (one sample, 7 ug/L), phenanthrene (one sample, 149 ug/L), and pyrene (one sample, 23 ug/L) were detected in the groundwater samples.

Triegel, 1987 to 1994: In 1987, Triegel drilled 11 soil borings and installed three replacement and two new monitoring wells. Samples of the groundwater and the oil/groundwater mixture were analyzed for VOCs, SVOCs, pesticides, and PCBs. In addition, as a result of damage to the monitoring wells between 1987 and 1991, nine monitoring wells were abandoned and replaced, and one new monitoring well (MW-8) was installed in 1991. The new monitoring wells were subsequently sampled for VOCs and SVOCs.

Groundwater data from 1987 showed the presence of methylene chloride (three samples, 1 to 4 ug/L), benzene (four samples, 1 to 79 ug/L), toluene (two samples, 2 and 3 ug/L), ethylbenzene (one sample, 3 ug/l), acenaphthene (one sample, 20 ug/L), bis(2-ethylhexyl)phthalate (two samples, 10 and 20 ug/L), di-n-butylphthalate (one sample, 20 ug/L), fluoranthene (one sample, 20 ug/L), fluorene (two samples 20 and 2,000 ug/L), phenanthrene (three samples, 10 to 3,000 ug/L), pyrene (two samples 10 and 2 ug/L), dichlorodiphenyldichloroethylene (DDE) (one sample, 0.1 ug/L), and dichlorodiphenyltrichloroethane (DDT) (one sample, 0.11 ug/L) in one or more of the monitoring wells. The detected concentrations were primarily found in the samples collected from monitoring wells MW-5 and MW-6 (Appendix B: Figure 5 - Residual Separate-Phase Product Investigation Points).

Groundwater data from 1991 showed the presence of benzene (one sample, 23 ug/L), ethylbenzene (one sample, 35 ug/L), chloroform (one sample, 6 ug/L), acenaphthene (one sample 13 ug/L), bis(2-ethylhexyl)phthalate (three samples, 11 to 340 ug/L), butylbenzylphthalate (one

sample, 170 ug/L), fluoranthene (one sample, 14 ug/L), fluorene (two samples, 20 and 150 ug/L), isophorone (one sample, 15 ug/L), n-nitrosodiphenylamine (two samples, 21 and 140 ug/L), naphthalene (one sample, 91 ug/L), phenanthrene (two samples 31 and 240 ug/L), and pyrene (three samples 10 to 120 ug/L). The detected concentrations were primarily found in the samples collected from monitoring wells MW-5 and MW-6 (Appendix B: Figure 5 - Residual Separate-Phase Product Investigation Points).

The results of the investigation confirmed that the presence of residual SPL near MW-5 and MW-7 was limited to the fill material or the upper clayey silt units of the remnant meadow mat, approximately eight feet bgs. Soil and groundwater samples indicated that the weathered SPL did not contain VOCs that readily emitted organic vapors or result in high concentrations of dissolved-phase VOCs in groundwater. In addition, data for wells downgradient of those containing SPL indicated that the SPL was not migrating or discharging to Chester Creek or the Delaware River.

Asea, Brown, and Boveri, 1995: Asea, Brown, and Boveri (ABB) developed a proposed action plan to bring the Penn Steel Area to closure with consideration of the Act 2 guidance. The Final Proposed Action Plan was submitted to PADEP in May 1996. The plan recommended collecting additional groundwater samples, instituting a Site Management Plan (SMP), and exploring the feasibility and methods for SPL recovery.

Roux, 1997-1999: Roux was retained by the facility to complete further investigations in the Penn Steel Area to evaluate the distribution of SPL in the subsurface, assess the feasibility of recovering the SPL, and demonstrate attainment of the Act 2 standards. Between 1997 and 1999, these activities included advancing eight temporary Geoprobe monitoring points to delineate the downgradient extent of the SPL; installing three downgradient monitoring wells; excavating 11 test pits adjacent to the Delaware River to evaluate the potential for historical free product migration in groundwater; installing four temporary monitoring points in the backfill of the test pits; and collecting two rounds of groundwater samples and analyzing them for BTEX and dissolved metals (1997), and the PADEP Short list of Petroleum Products (1998). In addition, the 1997 groundwater samples were analyzed for TDS to assess if TDS were above the 2,500 mg/L threshold required for application of alternate Act 2 groundwater standards.

None of the VOCs analyzed for were detected above method detection limits in the groundwater

samples collected in August 1997. However, benzo(a)anthracene (one sample, 2.8 ug/L), chrysene (two samples, 2.3 and 2.7 ug/L), fluorene (two samples, 25 and 30 ug/L), phenanthrene (two samples, 24 and 25 ug/L), and pyrene (five samples, 6.2 to 32 ug/L) were detected primarily in the groundwater samples collected from monitoring wells MW-8 and MW-10 (Appendix B: Figure 5 - Residual Separate-Phase Product Investigation Points). Zinc was detected in four samples ranging from 20 to 220 ug/L. TDS values ranged from 260 to 540 mg/L.

Benzene (one sample, 1.2 ug/L), ethylbenzene (two samples, 3.9 and 4.3), and cumene (three samples (2.9 to 8.8 ug/L) were detected in three groundwater samples collected in 1998. VOCs were not detected above laboratory reporting limits in sample MW-10, which was collected beneath a sheen of SPL.

Benzo(a)anthracene (one sample, 2.8 ug/L), chrysene (two samples, 2.3 and 2.7 ug/L), fluorene (two samples, 25 and 30 ug/L), phenanthrene (two samples, 24 and 25 ug/L), and pyrene (five samples, 6.2 to 32 ug/L) were detected primarily in the samples collected from monitoring wells MW-8 and MW-10 in 1998.

Based on the results of the investigation activities, Roux noted that SPL was present in isolated pockets near MW-6R, MW-8, and MW-10. The SPL was approximately 0.17 feet thick at MW-6 and measured less than 0.1 feet thick at MW-8 and MW-10. In addition, SPL was reportedly not present in the monitoring points installed along the downgradient edge of the property.

Atlantic, 1999 to 2001: Atlantic was retained by the facility to complete additional groundwater sampling to fulfill the minimum requirements of Act 2 standards. Between September 1999 and June 2001, Atlantic collected eight rounds of groundwater samples from the point-of–compliance wells (MW-1SR, MW-2SRR, MW-4, MW-11, MW-12, and MW-13) and monitoring wells MW-8 and MW-10. The samples collected at monitoring wells MW-8 and MW-10 were collected at the oil/water interface. In addition, SPL recovery was conducted in four monitoring wells (MW-1SR, MW-6, MW-8, and MW-10) over a period of eight weeks in 2000.

The analytical results for the groundwater samples collected by Atlantic from 1999 through 2001 indicated that four of the eight monitoring wells contained detectable concentrations of VOCs and SVOCs.

Constituent	MW-1SR	MW-2SRR	MW-8	MW-10
	Max Detection (ug/L) Detection Frequency	Max Detection (ug/L) Detection Frequency	Max Detection (ug/L) Detection Frequency	Max Detection (ug/L) Detection Frequency
Benzene	ND 0/8	ND 0/8	6.2 1/5	ND 0/5
Cumene	ND 0/8	ND 0/8	7.5 5/5	4.8 5/5
Toluene	ND 0/8	ND 0/8	2.1 1/5	ND 0/5
Chrysene	10 1/8	ND 0/8	ND 0/5	ND 0/5
Fluorene	11 1/8	ND 0/8	20 5/5	27 4/5
Naphthalene	ND 0/8	5.3 1/8	16 3/5	6.7 2/5
Phenanthrene	ND 0/8	ND 0/8	13 2/5	25 3/5
Pyrene	44 2/8	ND 0/8	16 3/5	17 3/5

According to the report, only three VOCs (methylene chloride, benzene, and cumene) were historically detected above the PADEP used aquifer, total dissolved solids less than 2,500 mg/L, non-residential groundwater MSCs since 1985. Although methylene chloride was detected above the MSC in 1985, the concentrations in subsequent samples collected in 1987 and 1991 were below the MSC or not detected. Therefore, Atlantic concluded the presence of methylene chloride may have been a laboratory artifact. Concentrations of benzene detected in samples collected at monitoring wells MW-3 (maximum concentration of 26 ug/L in 1985) and MW-5 (maximum concentration of 79 ug/L in 1987) decreased to non-detect during the 1997 and 1998 sampling events. Cumene, detected at a maximum concentration of 8 ug/L in MW-12 during the 1998 sampling event was non-detect over eight consecutive quarterly sampling events conducted between September 1991 and May 2001.

Based on laboratory analyses of the SPL collected from MW-5, the SPL consisted of long-chain low solubility SVOCs that were likely a residual product of an old, highly-weathered product that originated as heating oil from the former Penn Steel operations. The SPL appeared to be present in isolated pockets or discontinuous sheens downgradient of monitoring wells MW-5 and MW-6

where measurable thicknesses of SPL were encountered. SPL was not observed in monitoring points located along the downgradient property boundary, and no product seeps were observed along the Delaware River. Therefore, it was concluded that the SPL was immobile and stable, and was not discharging to the Delaware River. In addition, no USTs or conveyance piping was encountered during the subsurface investigation activities or during construction that had occurred on the property. Therefore, Atlantic concluded that there was no ongoing source for the SPL.

The SVOCs detected in the soil samples collected near areas where the SPL was observed were consistent with the SVOCs detected in the SPL collected from MW-5. Atlantic also noted that the concentrations of SVOCs detected in the soil samples were two orders of magnitude less than the PADEP direct contact and used-aquifer soil to groundwater non-residential MSCs. Dissolved concentrations of SVOCs (naphthalene, phenanthrene, fluoranthene, and pyrene) detected in groundwater samples collected from monitoring well MW-5 had decreased from the initial 1985 sampling event to non-detect in the 1998 and subsequent sampling events. Similar decreases in dissolved SVOC concentrations were observed in groundwater samples collected from MW-8 and MW-10 (located downgradient of MW-5 and MW-6) where the detected SVOCs had decreased below the PADEP non-residential MSCs between the 1998 and 2001 sampling events.

Based on the investigation activities conducted at the Penn Steel Area, Atlantic concluded that because concentrations of detected VOCs and SVOCs had declined below the non-residential used aquifer MSCs at the point-of-compliance wells, attainment had been demonstrated for groundwater at the site. Furthermore, because the residual SPL in the soil was not degrading groundwater above the MSCs, direct contact with SPL or contaminated soil was eliminated by the presence of the asphalt surface maintained by the facility, the SPL was not readily emitting vapors, and no habitable structures were located at the Penn Steel Area, no further investigation or remediation of the SPL or contaminated soil was warranted. Accordingly, the facility was requesting a no further action determination from PADEP for the Penn Steel Area with the submission of the Final Report.

According to the facility representatives, no response has been received from PADEP to date. (Note: According to the report, the Penn Steel Area was never formally entered into the Act 2 program.) A SMP for the Penn Steel Area is maintained in the facility's files. The SMP states that both engineering and institutional controls will be implemented. Engineering controls

include maintenance of the asphalt cap over the former Penn Steel operational areas (i.e., areas where SPL has been observed) and the privacy-screened, razor wire-topped chain link perimeter fence. In addition, 24-hour security guard service is stationed at the entrance to the Penn Steel Area, and access is limited to employees or authorized contractors. Institutional controls currently in place for the Penn Steel Area include zoning restrictions (limited to heavy industrial), lease agreements with the City of Chester for the eastern portion of the Penn Steel Area, and limited access to authorized employees, truck drivers, and contractors.

Inspections

Waste

Available records indicate that hazardous waste inspections were conducted at the facility on November 19, 1980 (USEPA RCRA inspection); August 27, 1981; February 7, 1989; June 12 and 22, 1990; March 25, 1992; September 28, 1994; April 24, 1995 (PADEP/USEPA Joint Inspection); September 5, 1996; December 22, 1998; February 7, 2002; September 3, 2003; February 14, 2005, January 24, 2006; and November 27, 2007. No violations were observed unless otherwise noted.

During the November 19, 1980 RCRA inspection conducted by USEPA, it was determined that the facility had not reported as a generator of solvent wastes generated in its parts washers because the parts washers were leased from and maintained by Safety-Kleen, which was believed to be a violation of the regulations. USEPA ultimately deferred to PADEP to follow up. Other violations noted during this inspection included missing information from the generator's manifest, accumulation dates not marked on each container, and lack of waste determination for friable and non-friable asbestos that was removed from obsolete equipment.

On September 9, 1981, PADEP issued a NOV to the facility for failure to make a waste determination available for the Safety-Kleen solvent, following an inspection conducted on August 27, 1981.

During the February 7, 1989 inspection conducted by PADEP, no violations were noted at that time. However, the inspection report stated that the facility needed to obtain a permit for its cogeneration plant and determine whether the wastewater elementary neutralization unit qualified for PBR status. On March 24, 1989, PADEP issued a NOV for these observations.

The March 25, 1992 inspection report states that the facility was not a TSD facility. In addition, PADEP had made an inspection of the PBR status of the wastewater elementary neutralization system which was currently under review.

A joint multimedia compliance inspection was conducted on November 14, 1994 by PADEP and USEPA during which the facility's operations as they relate to RCRA, storage tanks, the Clean Air Act, the Clean Water Act, and the Toxic Substances Control Act (TSCA) (related to PCBs) were observed. Several violations were observed related to RCRA that included manifest discrepancies and lack of written job descriptions for hazardous waste handlers. In addition, it was noted that the joints/seams in the concrete floor of the hazardous waste accumulation area (Building 81) were not sealed. Violations with regard storage tanks included a cracked containment structure for a diesel AST in the Penn Steel Area, and water/debris in the containment structures for one transformer and the unloading area for the No. 6 fuel oil AST. The ability of the containment area for two ASTs (referred to as 4 and 5) to contain the full quantity of fuel from the delivery trucks was questioned. Administrative errors were noted with regard to the facility's sampling plan relative to the Clean Water Act. Multiple violations were observed relative to TSCA including poor housekeeping near PCB-containing transformers, deficient inspection records, and deficient labeling of in-service transformers. There were no violations of the Clean Air Act noted during the inspection. The report also stated that there were no conveyances (i.e., septic systems, cesspools, unlined basins, etc.) at the facility. The facility provided to USEPA responses to the deficiencies noted during the inspection on November 29, 1994, December 7, 1994, December 29, 1994, and January 6, 1995.

The December 22, 1998 inspection report noted that the facility replaced the Safety-Kleen parts washers with Simple Green parts washers that use a non-hazardous citrus-based cleaner. In addition, it was stated that the effluent from the wastewater elementary neutralization system (classified as D002 waste) was not to be counted toward the hazardous waste generation total. Therefore, the facility should be reclassified as a SQG.

A November 27, 2007, inspection noted a drum of fluorescent bulbs was unlabeled and that drums were exceeding accumulation dates for universal waste.

Air

On November 18, 1986, the facility received a NOV for opacity violations (greater than 60%) for

the oil/gas fired boilers. An abatement plan was requested. The facility responded noting an instantaneous drop in pressure of the oil feeding the equipment and indicated all other operations were normal.

On March 16, 1989, the facility received a NOV for opacity violations (greater than 60%).

On February 12, 1990, an agreement was issued for failure to test CEMs on Boiler No. 10 within 210 days of startup. It was signed on March 6, 1990.

PADEP received a complaint on November 14, 1995 regarding fugitive emissions from the coal stockpile. There was a similar complaint submitted on March 13, 1996 and a NOV was issued on March 29, 1996. The facility responded on April 8, 1996 noting the implemented fugitive dust management practices. A subsequent NOV was issued on September 16, 1997 regarding control of dust generation on roadways within the facility.

On March 7, 1997, the facility provided notice regarding a boiler tube leak incident that occurred on February 20, 1997 that resulted in opacity limit exceedances, due only to steam emissions. On June 19, 1997, the facility provided notification that opacity values exceeded permit limits for Boiler No. 10. PADEP notified the facility on September 2, 1997 that opacity violations occurred during the first quarter of 1997 for Boiler No. 2, and enclosed a Consent Assessment for the facility's signature. On September 22, 1997, an internal PADEP memo indicated a meeting was held to settle a civil penalty with the facility for the opacity violations. However, since there were no NOx or sulfur oxides (SOx) exceedances, PADEP agreed that there was no permit violation.

An August 13, 1998 inspection identified that some machinery and paper machines required flow meters and other necessary repairs. No enforcement action was taken as these were minor repairs. No threat was posed to the community.

On May 8, 2000, the facility received an NOV following a February 1, 2000 inspection noting that amounts of fuel oil in excess of the permit limit were burned in Boiler No. 6.

On August 3, 2000, the facility received an NOV for not preventing particulate matter from becoming airborne as it related the petroleum coke storage pile. The facility responded noting the

detailed procedures in place to prevent airborne particulates.

On January 12, 2001, the facility notified PADEP of opacity emission excursions from Boiler No. 10 that resulted from an inadvertent valve opening.

PADEP memo dated May 3, 2001 indicated that a monetary settlement was reached with the facility following fugitive emissions violations and violations from burning quantities of fuel oil in excess of permit limits. The case was closed on April 23, 2001.

On July 3, 2002, the facility provided PADEP notification of a permit deviation occurring on July 3, 2002 at the wet scrubber in the Perini Converting Department noting a temperature increase. The facility requested a temporary release of the limit.

On May 19, 2006, the facility provided PADEP email correspondence regarding opacity monitoring failures but did not result in opacity limit violations on March 19 and 20, 2006.

On June 1, 2007, the facility received an NOV regarding the failure to surrender the NOx allowances to PADEP, which was a permit deviation. The facility amended this violation on June 13, 2007 by transferring allowances, and the violation was abated.

A Consent Assessment of Civil Penalty was signed on June 26, 2008 regarding the late submission of the Title V Application.

A closure memo dated October 14, 2008 indicated that the September 9, 2008 NOV initially issued for under-reporting NOx emissions was nullified as the revised emissions inventory discrepancy was self-reported and corrected.

On November 2, 2009, the facility received a NOV for under-reporting VOC emissions.

NPDES

Available records indicate that inspections were conducted in relation to the facility's NPDES permit from 1975 to 2009. Compliance with the permit conditions was documented during inspections conducted on February 22, 1995, January 29, 1996, February 14, 2005, January 24, 2006, February 11, 2007, and June 17, 2008. Inspections where violations were noted are

described below.

On January 14, 1975, the facility made notification of NPDES violations for BOD.

On November 25, 1981, the facility received a NOV for exceeding BOD and cyanide limits at Outfall 001.

On March 21, 1986, PADEP sent the facility the Consent Order and Agreement which noted discharges above revised permit limits for TSS, aluminum, and pH.

On June 1, 1989, an inspection noted violations for a lack of calibration or maintenance records for chlorine analyzers and analytical methods for discharge to Outfall 001 were not included in the results log.

On January 22, 1997, an inspection noted that Outfall 003 was removed from service. The waste stream was re-routed to a sump behind Building 83 and then sent to the wastewater elementary neutralization system.

On November 28, 2006, an inspection noted that Outfalls 8, 9, 12, 13, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, and 31 were for stormwater only. Outfall 13 was to be closed due to the pulp dock closing.

On February 6, 2007, the facility sent signed copies of a Consent Order and Agreement and the penalty for effluent spills to the Delaware River from effluent process pipes underneath the dock.

On November 10, 2009, the facility received an NOV regarding late submission of discharge monitoring reports (DMRs).

C. Description of Exposure Pathways for all Releases or Potential Releases

Air: The facility is located in an industrial/commercial area of the City of Chester, Pennsylvania. The City of Chester had an estimated population of 37,101 in 2009, according to the US Census Bureau (www.factfinder.census.gov, accessed November 5, 2010). The facility currently operates

under a Title V Operating Permit for various emissions units associated with paper manufacturing. Emissions in excess of permit limits are not anticipated under normal operating scenarios.

Based on available records, three AOCs were identified where extensive soil and groundwater investigations have occurred. These AOCs include the No. 2 Fuel Oil Area, the Mill Area UST Removal Area, and the Penn Steel Area. Remedial activities have been conducted including excavation of contaminated soils, and extraction of SPL and contaminated groundwater. However, it was documented that some contaminated soil was left in place due to the presence of subsurface building structures and underground utility lines, and SPL remains in the subsurface in the No. 2 Fuel Oil Area and the Penn Steel Area. Buildings located in the vicinity of the No. 2 Fuel Oil Area include the buildings associated with the cogeneration plant, the raw water filter plant, and the other support buildings. The Mill Area UST Removal Area is situated directly adjacent to the mill buildings. Buildings located in the Penn Steel Area are primarily support structures for the coal handling/storage areas. There is a guard shack at the entrance to the Penn Steel Area that is occupied by a security guard 24 hours per day, seven days per week. Accordingly, the vapor intrusion pathway into onsite buildings that are used on a daily basis is a potential exposure pathway.

Groundwater: The depth to shallow groundwater in the overburden aquifer ranges from three to nine feet bgs depending on the time of the year and the tidal cycle of the adjacent Delaware River. The general direction of groundwater flow is to the southeast toward the Delaware River. In the No. 2 Fuel Oil Area, natural diffuse groundwater discharge to the Delaware River is inhibited by the sheet pile bulkhead, which is driven an average of 32 feet into the underlying sediments (Atlantic, 2000). In the Mill Area UST Removal Area, groundwater may be redirected to the east and possibly to the north due to the presence of the large asphalt-paved areas, the basement complex beneath several of the mill buildings, and the presence of backfill materials in the UST removal area (GTI, 1990). In the Penn Steel Area, groundwater appears to flow radially to the Chester Creek and the Delaware River (Atlantic, 2001). The calculated hydraulic gradient across this area was 0.003 feet per foot. The permeability of the fill materials was reportedly 2.8 feet per day (ft/day), while the permeability of the deeper "meadow mat" materials was 0.03 ft/day (Atlantic, 2001). Deeper groundwater was not investigated.

The facility and surrounding areas are serviced by public water supplied by the Chester Water Authority. The Chester Water Authority obtains its water from two surface water supplies in the

Susquehanna River Basin located over 20 miles outside of the city (Atlantic, 2000). The main supply is withdrawn from the reservoir on Octorara Creek in Oxford, Pennsylvania. Water is also obtained from the Conowingo Pool of the Susquehanna River.

Eight (8) groundwater wells were identified within a 0.5-mile radius of the facility, according to the Pennsylvania Department of Conservation and Natural Resources (DCNR) Groundwater Information System (PaGWIS). All of the wells are listed as destroyed, except one well that is listed as unused. Four of the wells were located northwest of the facility across Route 291. The closest well was approximately 0.25-miles northwest of the Penn Steel Area. Two of the wells were located northeast of the facility along north of Morton Avenue, approximately 0.4 miles northeast of the Mill Area UST Removal Area. The wells were installed in the 1930s and 1940s and range in depth from 110 to 317 feet bgs. Two of the wells were located at the facility, and are listed as destroyed. These wells were reportedly installed in 1931. There are no known groundwater wells in use at or near the facility for municipal, domestic, or agricultural use at this time. As previously discussed, there are monitoring wells located on the property that were installed during the investigation activities completed at the facility in the 1980s and 1990s. The majority of these wells remain open.

Based on this information, direct contact exposure to contaminated groundwater is not considered a potential pathway. However, due to the shallow depth to groundwater, exposure to contaminated groundwater and SPL at the three AOCs is a potential pathway for subsurface activities (i.e., construction or utility work).

Surface Water/Sediment: The Delaware River, which flows to the southwest, is the principal surface water feature near the facility. Chester Creek flows across the property from the northwest to southeast and discharges into the Delaware River between the mill area and the Penn Steel Area. According to PADEP eMapPA (accessed June 7, 2010), the Delaware River and Chester Creek have designated uses as a warm water fisheries in accordance with the standards contained in Chapter 93 (Water Quality Standards) of Title 25 (Environmental Protection) of the Pennsylvania Code. Both water bodies are on the streams integrated list (reported for the Clean Water Act) as non-attaining segments, i.e., impaired for fish consumption resulting from unknown sources of PCBs.

The facility operates under an NPDES permit for eight outfalls that discharge to the Delaware

River and one outfall that discharges to Chester Creek. As previously discussed, the outfalls receive stormwater from the rooftops and parking areas except Outfalls 001 and 006. Outfall 001 is used for emergency discharge of raw and filtered Delaware River water which may contain trace concentrations of sodium bromide and sodium hypochlorite. Outfall 006 was recently diverted back into the filter plant.

Several of the facility's ASTs that contain treatment chemicals for the wastewater elementary neutralization system and fuel oil are located outdoors; however, these ASTs are situated in secondary containment structures. In addition, the facility's hazardous waste accumulation area is located on the concrete floor inside of Building 81. Therefore, it is anticipated that releases that may occur in these areas would not enter the storm sewer system or directly discharge into the Delaware River or Chester Creek. Therefore, direct discharges of contaminated surface water runoff to these surface water bodies is not expected at this time.

As previously discussed, there are three known AOCs where groundwater contamination, including SPL, has been documented. Groundwater flows primarily to the southeast and discharges to the Delaware River and Chester Creek, which is located between 100 and 500 feet from the contamination source areas. Therefore, direct discharges of contaminated groundwater to these surface water bodies is a potential exposure pathway for this facility.

Soil: According to the Final Reports for the No. 2 Fuel Area (Atlantic, 2000) and the Penn Steel Area (Atlantic, 2001), the facility is located on the western edge of the Coastal Plain Physiographic Province of Pennsylvania. The uppermost material underlying the asphalt and gravel surfaces is fill material consisting of fine sand and silt, cinders, bricks, rocks, and wood that was used to build up the waterfront and provide structural stability for slab-grade buildings that were constructed in the mill area in previously low lying areas. Slag and foundry sand were also observed in the Penn Steel Area. The thickness of the fill material ranges from five to 16 feet. The fill material overlies an organic-rich swamp deposit or meadow mat, which in turn overlies the Quaternary age deposits of the Trenton Gravel. The Trenton Gravel is described as a gray or pale-reddish brown, very gravelly unit interstratified with cross-bedded clay-silt beds.

The Trenton Gravel overlies the Precambrian age Wissahickon Formation, a medium- to coarse-grained, banded, micaceous schist. The Wissahickon Formation commonly weathers to a dense, low permeability saprolite layer. The saprolite layer generally acts as an aquitard between the

unconsolidated aquifer and the underlying bedrock (Atlantic, 2001). Bedrock was reportedly not encountered during investigations completed in the mill area; however, bedrock was encountered at approximately 20 feet bgs near Front Street to 60 feet bgs along the Delaware River during investigations completed in the Penn Steel Area.

As previously discussed, contaminated soil and residual SPL were left in place at the No. 2 Fuel Oil Area, the Mill Area UST Removal Area, and the Penn Steel Area due to the presence of underground utilities and building foundations, and the infeasibility of removing the SPL. The majority of the mill area (including the No. 2 Fuel Oil Area) is covered with impermeable surfaces (e.g., buildings and asphalt-paved or concrete roads/parking areas). Relatively small areas of permeable gravel surfaces were observed primarily adjacent to the mill building (Mill Area UST Removal Area), in the vicinity of the raw water filter plant (No. 2 Fuel Oil Area), and along the banks of the Delaware River. In the Penn Steel Area, the western half of the property where residual SPL was observed is asphalt-covered. The eastern half of property is covered with gravel, coal and the coal storage and handling structures. Therefore, it is concluded that exposure to contaminated soil is a potential exposure pathway at this facility, primarily for exposures to contaminated soil encountered during subsurface activities (i.e., construction or utility work).

D. Exposure Pathway Controls and/or Release Controls Instituted at the Facility

Air: The facility currently operates under a TVOP for various emission units associated with paper manufacturing. The facility also submitted miscellaneous RFDs for installing permit-exempt equipment. Kimberly-Clark routinely submits the required annual air emission inventories, the associated air permit fees, and annual and semiannual compliance certifications. On November 2, 2009, the facility received a NOV for under reporting VOC emissions.

The USEPA has requested that the vapor intrusion pathway be evaluated as part of the EI process. The USEPA 2002 OSWER *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)* provides a methodology for vapor intrusion evaluation under the current land use conditions using available site data. It should be noted that the USEPA 2002 guidance is not generally recommended for use in settings that are primarily occupational. However, the PADEP Land Recycling Program *Technical Guidance Manual – Section IV.A.4 (Vapor Intrusion into Buildings from Groundwater*

and Soil under the Act 2 Statewide Health Standard) can be applied to both residential and nonresidential receptors. This guidance provides decision matrices for soil and groundwater (under a Statewide Health, generic approach) for determining if indoor air quality may be of concern. Therefore, the PADEP Technical Guidance Manual was used, as deemed appropriate, to evaluate a potential vapor intrusion pathway in this report.

Extensive soil and groundwater investigations have occurred at the three AOCs, the No. 2 Fuel Oil Area, the Mill Area UST Removal Area, and the Penn Steel Area. Remedial activities have been conducted at the site including excavation of contaminated soils, and extraction of SPLs and contaminated groundwater. However, it was documented that some contaminated soil was left in place due to the presence of subsurface building structures and underground utility lines, and SPL remains in the subsurface in the No. 2 Fuel Oil Area and the Penn Steel Area. Buildings located in the vicinity of the No. 2 Fuel Oil Area include the buildings associated with the cogeneration plant, the raw water filter plant, and the other support buildings. The Mill Area UST Removal Area is situated directly adjacent to the mill buildings. Buildings located in the Penn Steel Area are primarily support structures for the coal handling/storage areas. There is a guard shack at the entrance to the Penn Steel Area that is occupied by a security guard 24 hours per day, seven days per week. Accordingly, the vapor intrusion pathway into onsite buildings that are used on a daily basis is a potential exposure pathway from soil and/or groundwater and warrants further evaluation.

Groundwater: There have been no known releases to groundwater from the facility regulated hazardous waste accumulation area (Building 81); however, releases to groundwater have been documented for the three AOCs.

Extensive groundwater investigation and remediation work was completed at the No. 2 Fuel Oil Area. Available groundwater data suggests that the removal of SPL occurred to the extent possible and the operation of the groundwater remediation system was successful at remediating groundwater at and southeast of the source area (MW-1) below appropriate regulatory levels. According to the Final Report (Atlantic, 2000) submitted to PADEP in April 2000, an isolated area of SPL (less than 0.1 inches thick) remains near MW-1. This area is covered with ballast and asphalt surfaces. The most recent groundwater sample, which consisted of groundwater in direct contact with the SPL, was collected from the source area monitoring well (MW-1) in July 1999. The sample was analyzed for the PADEP Short List of Petroleum Products for Fuel Oil Nos. 2, 4, 5, and 6. Low concentrations of benzene (0.3 [J] ug/L), cumene (1.5 ug/L), fluorene (2 [J] ug/L),

and phenanthrene (3 [J] ug/L) were detected in the sample. The 1999 concentrations are below the current PADEP used aquifer TDS less than 2,500 mg/L non-residential MSCs of 5 ug/L for benzene; 3,500 ug/L for cumene; 1,900 ug/L for fluorene; and 1,100 ug/L for phenanthrene. Downgradient wells MW-11, SUMP-1, SUMP-2, and GW-1 were last sampled January 1998. These samples were analyzed only for BTEX and naphthalene, none of which were detected above laboratory detection limits; therefore, it is unknown whether PAHs are present in groundwater southeast of the source area. Soil samples collected directly downgradient of MW-11 and GW-1 in 1998 suggest that these constituents may have been present in groundwater at the time of the sampling although likely at low concentrations. The chemical quality of the groundwater southwest (vicinity of the No. 6 fuel oil AST) of the source area is unknown. As previously discussed, relatively high TPH concentrations were detected in soil samples in the vicinity of the No. 6 fuel oil AST and petroleum odors and sheens were observed on groundwater that infiltrated trenches dug around the bulkhead. No monitoring wells were installed; therefore, no groundwater data is available for this area.

In 1990, concentrations of benzene and ethylbenzene were detected above appropriate regulatory levels in two of the monitoring wells (MW-4 and MW-8) installed directly north of Buildings 20 and 21 in the Mill Area UST Removal Area. The 1990 concentrations of benzene detected in monitoring wells MW-4 (6.4 ug/L) and MW-8 (43 ug/L) are above the current PADEP non-residential MSC of 5 ug/L. The 1990 concentration of ethylbenzene detected in monitoring well MW-8 (1,500 ug/L) is above the current MSC of 700 ug/L. Elevated concentrations of xylenes were also present ranging from 40 ug/L in monitoring well MW-9 to 8,800 ug/L in monitoring well MW-5. These concentrations are below the MSC of 10,000 ug/L for total xylenes. Although a dual-phase vacuum extraction system was proposed to remediate groundwater, it was reportedly never implemented. Therefore, the chemical quality of the groundwater in this area is not known. The UST removal area, particularly directly north of Buildings 20 and 21, is gravel covered.

Groundwater analytical data for the Penn Steel Area suggests that while residual SPL remains, it is no longer degrading groundwater above appropriate regulatory levels. As previously discussed, groundwater samples collected from the groundwater/SPL interface at monitoring wells MW-8 and MW-10 during five sampling events conducted from March 2000 through May 2001 showed that none of the analytes analyzed for were detected above the PADEP non-residential MSCs, except for benzene that was detected at monitoring well MW-8 (6.2 ug/L)

above the MSC of 5 ug/L during one sampling event (May 2001). Benzene was not detected in either MW-8 or MW-10 above laboratory detection limits during any of the other sampling events. Removal of the SPL was deemed infeasible because it is present in isolated pockets or discontinuous sheens. According to the Final Report (Atlantic, 2001), the facility maintains the asphalt parking lot that was placed over the former Penn Steel operations, and the areas where SPL was identified.

Groundwater at or in the vicinity of the facility is not used for municipal, domestic, or agricultural use. In addition, the majority of the property is asphalt or concrete covered, and it is not expected that contaminated groundwater or residual SPL would be easily accessible during daily operations. In addition, the facility is entirely fenced and continuously monitored by security, which further limits accessibility to potentially contaminated areas to authorized personnel. Therefore, it is not expected that additional controls are needed for daily operations. However, because groundwater is shallow (three to five feet bgs), additional controls may be required for subsurface work (i.e., utility work) that may encounter contaminated groundwater.

Surface Water/Sediment: The facility maintains nine outfalls that are permitted under NPDES permit PA0013081. Seven of the outfalls discharge stormwater runoff from the facility parking areas and rooftops to the Delaware River. One outfall (Outfall 001) is the emergency drain for the filter plant and is only opened during an emergency. Another outfall (Outfall 006) was recently diverted and no longer discharges to the Delaware River. The discharges are routinely monitored, and discharges above effluent limits are not expected. The facility's process wastewater as well as stormwater runoff in the Penn Steel Area is discharged directly to the DELCORA sewer system under permit. The discharges are routinely monitored, and discharges above effluent limits are not expected. Therefore, it is concluded that no additional controls are necessary for discharges of stormwater or industrial wastewater.

Contaminated groundwater has been identified at three specific locations on the facility property. At the No. 2 Fuel Oil Area and the Penn Steel Area, SPL remains in the subsurface. Groundwater data for downgradient wells in both of these areas in the 1990s suggested that contaminated groundwater was not discharging to the Delaware River from either of these areas. As previously discussed, the current chemical quality of the groundwater southwest of the No. 2 Fuel Oil Area source area (No. 6 fuel oil UST and bulkhead area) located approximately 150 feet of the Delaware River, and in the Mill Area UST Removal Area located approximately 500 feet upgradient of the Delaware River is

currently unknown. Therefore, it is unknown whether contaminated groundwater is discharging to the Delaware River such that unknown weather controls would be required.

Soil: There have been releases to soils at the facility resulting from the facility's leaking USTs and former historic operations unrelated to the facility (Penn Steel Area). These areas have been investigated. Contaminated soil and residual SPL was removed to the extent possible; however, some contaminated soil and SPL was left in place due to the presence of building foundations, underground utilities, and subsurface obstructions. In the No. 2 Fuel Oil Area, high TPH concentrations were detected in soil samples southwest of the recovery wells (SUMP-1 and SUMP-2). The highest concentrations were detected near the bulkhead, northeast of the No. 6 Fuel Oil AST during the 1989 and 1995 investigations. Sheens were also observed in groundwater infiltrating test pits in this area. No additional sampling was conducted in this area after cessation of the remediation system in 1996. Therefore, it is unknown whether soil is contaminated above appropriate regulatory levels or if SPL is present. This area is presently gravel covered. One soil sample collected northwest of (upgradient to) the recovery wells in 1998 contained elevated concentrations of PAHs. The concentrations of the PAHs detected in this sample were generally below the PADEP used aquifer soil to groundwater non-residential MSC, except naphthalene which was detected above the MSC. This sample was collected beneath the asphalt-paved roadway.

Contaminated soil was also left in place in the Mill Area UST Removal Area. Although a dual-phase remediation system was proposed for this area, available documentation suggests it was not installed. Therefore, the current chemical quality of the soil is unknown. The majority of the excavation areas are gravel covered. In the Penn Steel Area, SPL remains in the subsurface; however, the areas where SPL was observed are asphalt-covered.

It is not expected that contaminated soil or residual SPL would be easily accessible during daily operations. In addition, the facility is entirely fenced and continuously monitored by security, which further limits accessibility to potentially contaminated areas to authorized personnel. Therefore, it is not expected that additional controls are needed for daily operations. However, because some contaminated soil left in place may be shallow, additional controls may be required for subsurface work (i.e., utility work). A SMP is maintained at the facility for the Penn Steel Area. The SMP includes maintenance of the asphalt surface and security fence, and 24-hour security that limits access to authorized personnel.

E. Follow-up Action Items

USEPA Region III will decide if additional information or sampling at the facility is required to determine whether or not the environmental indicators have been met or if corrective action is required for the facility.

APPENDIX A

Photographs

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **1**	
VIEW **Southeast**	
PHOTOGRAPHS BY **Baker**	

Comments: Facility's raw river water intake – Delaware River.

PHOTOGRAPH **2**	
VIEW **Northwest**	
PHOTOGRAPHS BY **Baker**	

Comments: Raw water filter plant (clarifier, sand filters, and control building).

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **3**	
VIEW **West**	
PHOTOGRAPHS BY **Baker**	

Comments: Wastewater elementary neutralization system neutralized water ASTs (Tanks 088 and 089) and caustic soda AST (Tank 084).

PHOTOGRAPH **4**	
VIEW **Interior**	
PHOTOGRAPHS BY **Baker**	

Comments: Wastewater elementary neutralization system sodium bromide AST (Tank 091).

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **5**	
VIEW **Interior**	
PHOTOGRAPHS BY **Baker**	

Comments: Wastewater elementary neutralization system sodium hypochlorite AST (Tank 092) (view of secondary containment).

PHOTOGRAPH **6**	
VIEW **Interior**	
PHOTOGRAPHS BY **Baker**	

Comments: Wastewater elementary neutralization system sulfuric acid AST (Tank 093).

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **7**	
VIEW **Southwest**	
PHOTOGRAPHS BY **Baker**	

Comments: No. 6 fuel oil AST (Tank 058) located in the No. 2 Fuel Oil Area.

PHOTOGRAPH **8**	
VIEW **Southwest**	
PHOTOGRAPHS BY **Baker**	

Comments: Outfall 001 – Emergency outfall for raw water filter plant.

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **9**	
VIEW **Interior**	
PHOTOGRAPHS BY **Baker**	

Comments: Outfall 006 – Recently redirected into the raw water filter plant.

PHOTOGRAPH **10**	
VIEW **Interior**	
PHOTOGRAPHS BY **Baker**	

Comments: Building 81 – Hazardous waste accumulation area.

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **11**	
VIEW **Interior**	
PHOTOGRAPHS BY **Baker**	

Comments: Building 81 – Nonhazardous waste accumulation area.

PHOTOGRAPH **12**	
VIEW **Interior**	
PHOTOGRAPHS BY **Baker**	

Comments: Universal waste accumulation area inside of mill.

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **13**	
VIEW **Northwest**	
PHOTOGRAPHS BY **Baker**	

Comments: No. 2 fuel oil ASTs (Tanks 056 and 057) in the No. 2 Fuel Oil Area.

PHOTOGRAPH **14**	
VIEW **North**	
PHOTOGRAPHS BY **Baker**	

Comments: No. 2 Fuel Oil Area showing new aboveground piping and area where SPL was encountered.

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **15**	
VIEW **East**	
PHOTOGRAPHS BY **Baker**	

Comments: Mill Area UST Removal Area (MW-8 in foreground).

PHOTOGRAPH **16**	
VIEW **South**	
PHOTOGRAPHS BY **Baker**	

Comments: Penn Steel Area – Asphalt cap over residual SPL.

MICHAEL BAKER JR., INC. – PHOTOGRAPHIC RECORD

SITE NAME: Kimberly-Clark PA, LLC

PHOTOGRAPH **17**	
VIEW **West**	
PHOTOGRAPHS BY **Baker**	

Comments: Penn Steel Area – Coal storage and handling structures.

APPENDIX B

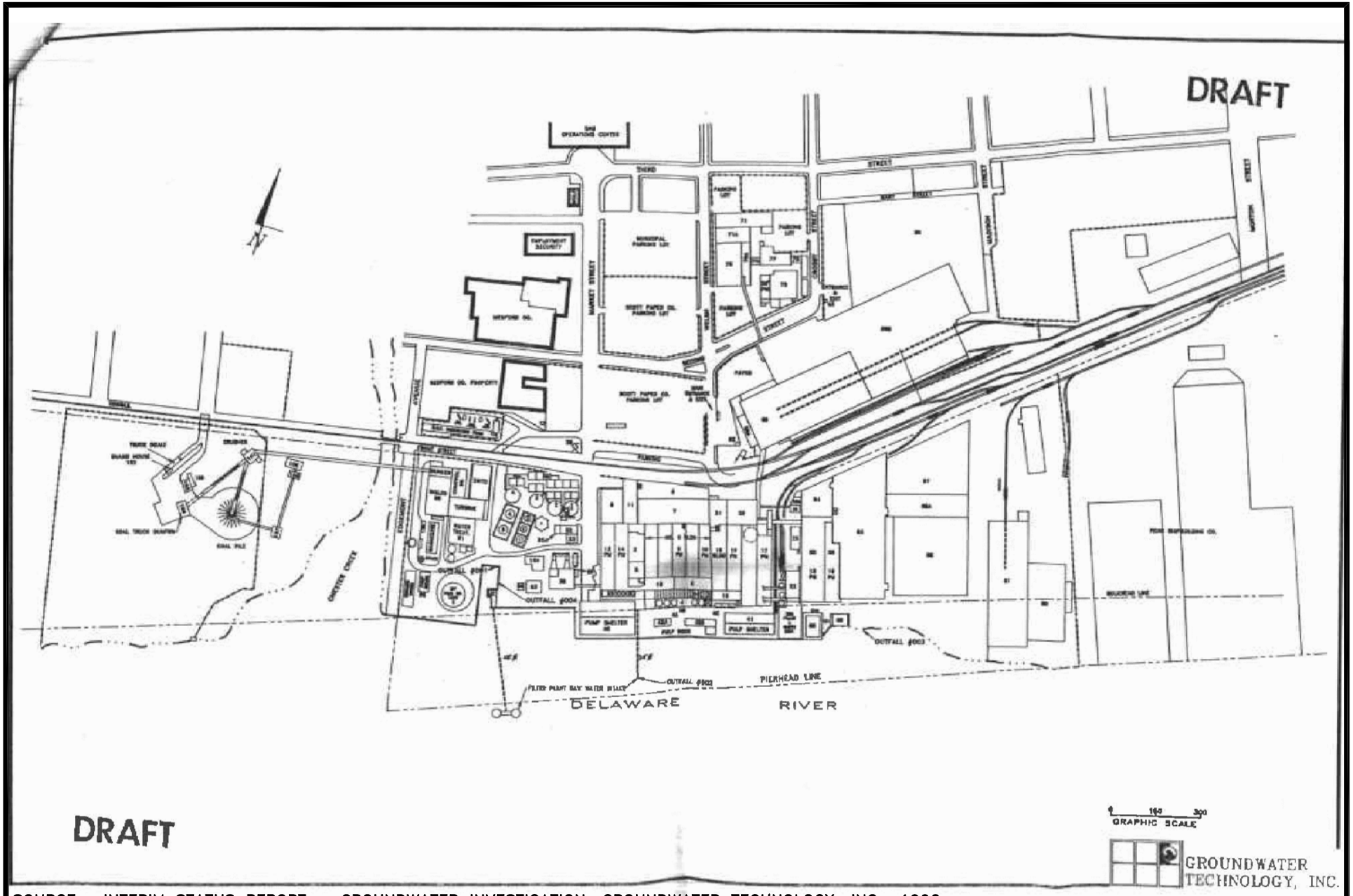
Figures

Source: Google 2010 maps

SCALE: 1"~ 500'	DATE: SEPT. 2011
S.O. NO.: 118036	FILE: 118036–KCP–01
DSN/DWN: KAT/WJH	CHK: SF

Baker MICHAEL BAKER JR., INC.
MOON TOWNSHIP, PENNSYLVANIA

FIGURE 1: FACILITY LOCATION MAP
KIMBERLY–CLARK PA, LLC
FRONT STREET AND AVENUE OF THE STATES
CHESTER, PENNSYLVANIA 19013

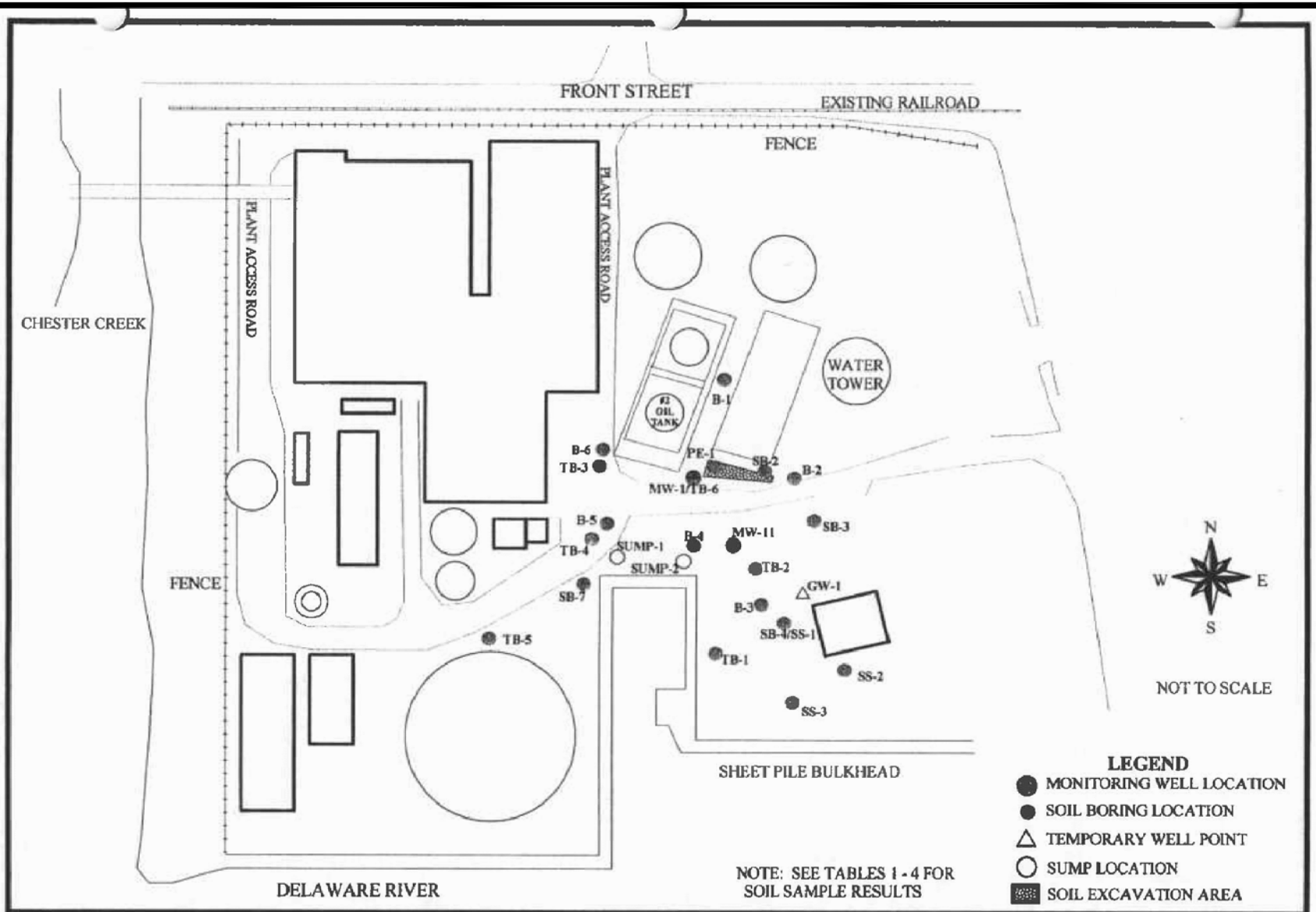


SOURCE: INTERIM STATUS REPORT – GROUNDWATER INVESTIGATION, GROUNDWATER TECHNOLOGY, INC., 1990

SCALE: 1" = 150'	DATE: NOV. 2010
S.O. NO.: 118036	FILE: 118036–KCP–02
DSN/DWN: KAT/WJH	CHK: SF

Baker MICHAEL BAKER JR., INC.
MOON TOWNSHIP, PENNSYLVANIA

FIGURE 2: FACILITY LAYOUT
KIMBERLY–CLARK PA, LLC
FRONT STREET AND AVENUE OF THE STATES
CHESTER, PENNSYLVANIA 19013



ATLANTIC
Environmental Consulting Services, L.L.C.

SOIL SAMPLE LOCATIONS
NO. 2 FUEL OIL AREA
KIMBERLY-CLARK CHESTER, PA

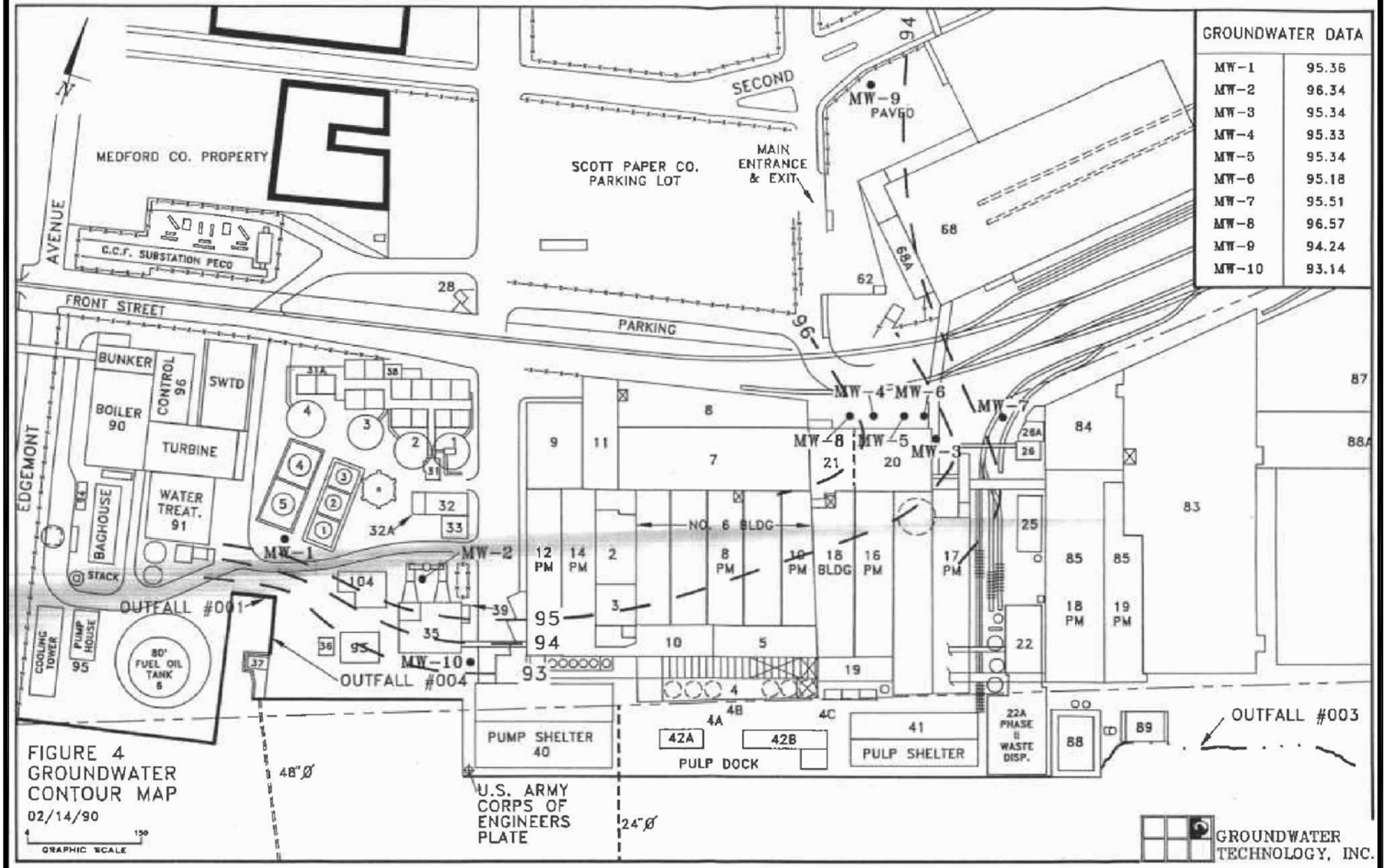
FIGURE 3

SOURCE: FINAL REPORT – NO. 2 FUEL OIL AREA, ATLANTIC ENVIRONMENTAL CONSULTING SERVICES. L.L.C., 2000

SCALE: AS SHOWN	DATE: SEPT. 2011
S.O. NO.: 118036	FILE: 118036-KCP-03
DSN/DWN: TE/WJH	CHK: TE

Baker MICHAEL BAKER JR., INC.
MOON TOWNSHIP, PENNSYLVANIA

FIGURE 3: SOIL SAMPLE LOCATIONS
KIMBERLY-CLARK PA, LLC
FRONT STREET AND AVENUE OF THE STATES
CHESTER, PENNSYLVANIA 19013

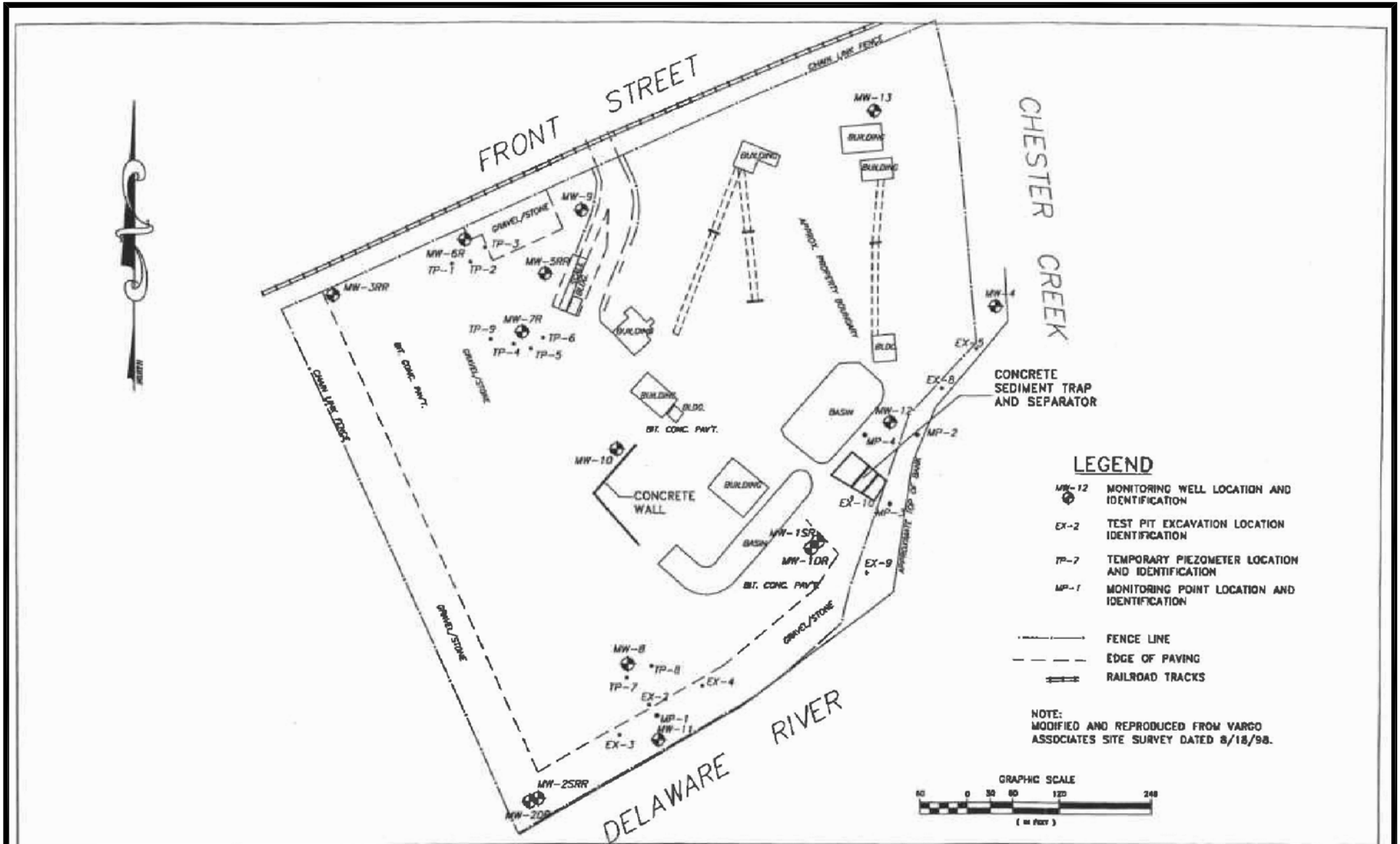


SOURCE: HYDROGEOLOGIC ASSESSMENT FORMER UNDERGROUND STORAGE TANK LOCATIONS, GROUNDWATER TECHNOLOGY, INC., 1990

SCALE: AS SHOWN	DATE: SEPT. 2011
S.O. NO.: 118036	FILE: 118036-KCP-04
DSN/DWN: TE/WJH	CHK: TE

Baker MICHAEL BAKER JR., INC.
MOON TOWNSHIP, PENNSYLVANIA

FIGURE 4: GROUNDWATER CONTOUR MAP
KIMBERLY-CLARK PA, LLC
FRONT STREET AND AVENUE OF THE STATES
CHESTER, PENNSYLVANIA 19013



ATLANTIC ENVIRONMENTAL CONSULTING SERVICES, L.L.C.	KIMBERLEY-CLARK CHESTER, PENNSYLVANIA	RESIDUAL SEPARATE-PHASE PRODUCT INVESTIGATION POINTS PENN STEEL AREA	DESIGNED BY SC	DRAWN BY CC	DATE AUGUST 01	PROJECT NO. 10027.06	FILE NAME 2801\2
			CHECKED BY TH	PROJECT MGR. SC	SCALE GRAPHIC	DRAWING NO. -	FIGURE 7

SOURCE: FINAL REPORT – PENN STEEL AREA, ATLANTIC ENVIRONMENTAL CONSULTING SERVICES, L.L.C., 2001

SCALE: AS SHOWN	DATE: SEPT. 2011	Baker MICHAEL BAKER JR., INC. MOON TOWNSHIP, PENNSYLVANIA
S.O. NO.: 118036	FILE: 118036-KCP-05	
DSN/DWN: TE/WJH	CHK: TE	

FIGURE 5: RESIDUAL SEPARATE-PHASE PRODUCT INVESTIGATION POINTS
KIMBERLY-CLARK PA, LLC
FRONT STREET AND AVENUE OF THE STATES
CHESTER, PENNSYLVANIA 19013

APPENDIX C

Inventory of Documentation and Reference Documents

The following is a list of documents in the order referenced in the report.

Document Date	**Document**
Site Layout and Background Information	
January 1, 2000	Final Report No. 2 Fuel Oil
January 1, 2001	Final Report Penn Steel Area
Reported Releases	
January 1, 2000	PPC Plan
April 10, 1981	NOV SS discharges
September 26, 1990	NOV Fuel Oil Release
May 3, 2000	Discharge Notification
March 23, 2001	Notice of Discharge
October 29, 2001	Notice of Discharge
August 9, 2006	Sulfuric Acid Release Correspondence
July 7, 2006	NOV Sulfuric Acid Release Correspondence
June 8, 2009	Notice of Sulfuric Acid Spill
Permit and Regulatory Action History	
August 13, 1980	Notification of Waste Activity
November 14, 1980	Part A Hazardous Waste Permit Application
July 27, 1981	USEPA Acknowledge Part A
September 9, 1981	Inspection with Waste Determination Not Available
March 4, 1983	Request for Part B of the Hazardous Waste Permit Application
November 17, 1983	NOV: No Part B
March 29, 1984	Not a TSD
April 24, 1986	Request for SWMU
March 24, 1989	NOV: WW Elementary Neutralization System Not Permitted
October 19, 1994	Notification of Hazardous Waste Activity
July 29, 2003	PADEP Approval of PBR Status for Cogeneration Plant
February 23, 2004	Residual Waste Report
March 22, 2006	Residual Waste Report
1999-2008	Air Inspections
1997-2000	AIMS
1997-2009	Air Permit Fees
January 4, 1999	NOx Allowances
September 1, 2000	Emission Test Report
January 14, 2003	Ownership Transfer Permits
August 23, 2001	TDF Application
1999-2002	TDF Correspondence
December 9, 2002	TDF Plan Approval Denial

January 23, 2004	Reduced Malodor Monitoring
March 4, 2005	Initial Notification for Installation of Boilers 8 through 10
June 22, 2006	Initial Notification for Finished Product Process
June 13, 2007	Napkin Process Removal
1990-1999	Quarterly CEM Reports
July 31, 1985	CEMS Application
February 24, 1989	RATA
February 24, 1995	RATA
January 24, 1997	RATA
September 30, 1998	RATA
October 21, 1999	RATA
September 1, 2000	RATA
February 5, 2004	RATA
April 13, 1993	Level IV Test Approved
March 11, 2005	CEMS Audit
March 19, 1996	CEMS Inspection
January 1, 1974	Historic PA0013081 Permit Correspondence
July 12, 1996	Permit Transfer
December 19, 2002	Facility Asset Transfer
June 19, 2003	Permit Transfer
December 5, 2005	NPDES Renewal
April 2, 2007	NPDES Renewal
December 8, 2004	DRBC PCB Monitoring
June 30, 2005	PMP Correspondence
August 8, 2007	PCB PMP
February 25, 2008	PMP Annual Report
February 25, 2009	PMP Annual Report
September 21, 2009	DRBC PCB Monitoring
October 2, 1996	Permit Renewal 140016
May 22, 2007	DELCORA Permit
1996-2003	Encroachment Permit and Correspondence
SWMUs and AOCs	
November 14, 1994	USEPA/PADEP Multimedia Inspection
July 10, 1974	SPCC Plan
October 1, 2000	SPCC Update
February 23, 2001	General Operating Permit for Tanks
2002-2007	AST Inspections
October 26, 1990	Tank Inventory
January 12, 2011	Updated List of ASTs Provided by Facility
September 24, 1990	Tank Removal
January 29, 1997	Tank Removal

January 14, 2002	Uncertified Tank Installer
January 15, 2003	AST Removal
November 6, 1989	UST Removal Report (Buchart-Horn)
April 26, 1991	PADEP Letter Approving In-situ Closure
January 14, 1997	UST Closure Report - Penn Shipbuilding Company UST
Investigations and Remedial Actions to Date	
October 29, 1980	Asbestos Inspection
May 3, 1988	Asbestos Removal Notifications
November 9, 1989	Triegel Subsurface Soil Investigation No. 2
January 22, 1990	Triegel Backhoe Trench Investigation Report
July 16, 1990	Oil Remediation Plan
May 15, 1989	Notification of UST Closures
September 29, 1989	Updated Notification of UST Closures
October 26, 1989	Request for Work Plan
April 2, 1990	Work Plan
May 11, 1990	Interim Report on GTI Investigation
June 1, 1990	Hydrogeological Assessment - GTI
June 5, 1990	PADEP Requests Remediation/GW Monitoring Plan
June 27, 1990	Facility Response to PADEP June 5, 1990 Letter
September 20, 1990	Letter from PADEP Requesting Additional Monitoring Wells
September 25, 1990	PADEP Request for Remediation/Groundwater Sampling Plans
November 14, 1990	Letter from Facility Outlining Proposed Additional Work
July 29, 1991	Recommendation of Two-Phase Vacuum Extraction
August 1, 1991	BCM Tank Removal Remedial Investigation and Cleanup Plan
September 26, 1991	Letter to Facility Stating that No. 6 Fuel Oil UST was Closed in Place
1991 - 1992	Groundwater Sampling Results for No. 6 Fuel UST Wells
Inspections	
1980-2007	Waste Inspections and NOVs
November 18, 1986	NOV Opacity
March 16, 1989	NOV Opacity
February 12, 1990	CEMS Signed Startup
March 6, 1990	Signed CEMS Agreement
November 14, 1995	Air Complaint
November 14, 1995	NOV Fugitives Management
April 8, 1996	NOV Fugitives Management
September 16, 1997	Dust Management NOV
March 7, 1997	Opacity Violation

June 19, 1997	Opacity Exceedance
September 2, 1997	CEMS Consent Assessment
August 13, 1998	CEMS Inspection
May 8, 2000	Fuel Oil NOV
August 3, 2000	NOV
January 12, 2001	Opacity
May 3, 2001	Fuel Limit Settlement
July 3, 2002	Permit Release Request
May 19, 2006	Opacity Monitoring Failure
June 1, 2007	NOV NOx Allowance
June 26, 2008	CACP Late Application
October 14, 2008	Closure Memo NOV Emission Reporting
November 2, 2009	NOV VOC Underreporting
January 14, 1975	BOD Exceedance
November 25, 1981	NOV Exceedance
March 21, 1986	COA Revised Permit Limits
June 1, 1989	NPDES Inspection
1990-2009	NPDES Inspections
February 6, 2007	COA Effluent Spills
November 10, 2009	NOV Late DMR